PB-217 420

CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE NORTH PLATTE RIVER. THIRD SESSION, HELD IN SCOTTSBLUFF, NEBRASKA ON NOVEMBER 20, 1963

Department of Health, Education and Welfare
Washington, D. C.

1963

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CONFERENCE

in the matter of

Pollution of the Interstate Waters of the
NORTH PLATTE RIVER

Third Session

Scottsbluff, Nebraska
November 20, 1963

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Washington 25, D. C.

287

CONFERENCE

in the matter of

Pollution of the Interstate Waters of the NORTH PLATTE RIVER

Third Session

Scottsbluff, Nebraska
November 20, 1963

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Washington 25, D. C.

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Conference in the Matter of Pollution of The North Platte River, convened at 9:15 a.m., Wednesday, November 20, 1963, in the City Council Chamber, Scottsbluff, Nebraska.

PRESIDING:

Mr. Murray Stein, Chief, Enforcement Branch, Water Supply and Pollution Control, Public Health Service, Department of Health, Education, and Welfare, Washington 25, D. C.

CONFEREES:

Herbert C. Clare, United States Public Health Service, Kansas City, Missouri

Dr. E. A. Rogers, Nebraska Department of Health, Lincoln, Nebraska

Dr. James W. Sampson, Wyoming Department of Public Health, Cheyenne, Wyoming

John S. Samson, Nebraska Water Pollution Control Council, Omaha, Nebraska

Arthur E. Williamson, State Sanitary Engineer, Wyoming Department of Public Health, Cheyenne, Wyoming

PARTICIPANTS:

Donald A. Townley, United States Public Health Service, Kansas City, Missouri

Jack R. Geckler, United States Public Health Service, Cincinnati, Ohio

Harold F. Clark, United States Public Health Service, Cincinnati, Ohio

Albert S. Konselman, Bureau of Mines, Denver Federal Center, Denver, Colorado

R. M. Sensintaffar, United States Bureau of Reclamation, Casper, Wyoming

Ray C. Williams, United States Bureau of Sport Fisheries and Wildlife, Grand Island, Nebraska

H. D. Burk, Great Western Sugar Company, Scottsbluff, Nebraska

Lloyd T. Jensen, Great Western Sugar Company, Denver, Colorado

T. A. Filipi, Nebraska Department of Health, Lincoln, Nebraska

Fred Eiserman, Wyoming Game and Fish Commission, Casper, Wyoming

Clifford E. Bosley, Wyoming Game and Fish Commission, Lander, Wyoming

PARTICIPANTS (Continued):

J. E. Browning, Holly Sugar Corporation, Colorado Springs, Colorado

O. Henry Engendorff, Commissioner of Agriculture, Wyoming Department of Agriculture, Cheyenne, Wyoming

William Schoenecker, Nebraska Game, Forestation and Parks Commission, Alliance, Nebraska

OTHERS IN ATTENDANCE:

L. G. Applegate, City Superintendent, Torrington, Wyoming

Ken Biglane, United States Public Health Service, Washington, D. C.

Hayse H. Black, United States Public Health Service, Cincinnati, Ohio

Dean W. Borthwick, Deputy Attorney General, Cheyenne, Wyoming

M. C. Cannon, Mitchell, Nebraska

Don Christensen, Scottsbluff Star-Herald, Scottsbluff, Nebraska

√

OTHERS IN ATTENDANCE (Continued):

Robert Edgar, City of Gering, Gering, Nebraska

John M. Fairall, United States Public Health Service, Cincinnati, Ohio

W. A. Gibson, Wyoming Stream Pollution Control Advisory Council, Torrington, Wyoming

Frank R. Harman, Wyoming Department of Public Health, Cheyenne, Wyoming

Ralph Hudelson, Wyoming Game and Fish Commission, Casper, Wyoming

E. A. Jarecki, United States Bureau of Reclamation, Region VII, Denver, Colorado

F. W. Kittrell, United States Public Health Service, Cincinnati, Ohio

Lester Klashman, United States Public Health Service, Denver, Colorado

Frank U. Koehler, City Manager, City of Scottsbluff, Scottsbluff, Nebraska

Peter G. Kuh, United States Public Health Service, Washington, D. C.

Mort Lebow, United States Public Health Service, Washington, D. C.

Frank E. Long, Wyoming Stream Pollution Control Advisory Council, Buffalo, Wyoming

VI

OTHERS IN ATTENDANCE (Continued):

Keith E. Miller, National Park Service, Scotts Bluff National Monument, Scottsbluff, Nebraska

Robert Millis, Wyoming Game and Fish Commission, Lander, Wyoming

Les Mortensen, City of Scottsbluff, Scottsbluff, Nebraska

M. Dale Nelson, Terrytown, Nebraska

William E. Nichol, Scottsbluff, Nebraska

Leonard Ortolano, United States Public Health Service, Denver, Colorado

Richard Peckham, Nebraska Game, Forestation and Parks Commission, Alliance, Nebraska

Larry Peterson, Wyoming Game and Fish Commission, Casper, Wyoming

Rheta B. Piere, United States Public Health Service, Washington, D. C.

Bernard R. Sacks, United States Public Health Service, Denver, Colorado

Lawrence A. Schmid, United States Public Health Service, Kansas City, Missouri

Elmer J. Scott, Holly Sugar Corporation, Worland, Wyoming

OTHERS IN ATTENDANCE (Continued):

T. H. Vanderhoof, West Nebraska Branch Laboratory, Nebraska Department of Health, Scottsbluff, Nebraska

Oscar Wiberg, Scotts Bluff County Health Department, Gering, Nebraska

Leo Winterer, City of Gering, Gering, Nebraska

Roy Witschy, Nature Club, Scottsbluff, Nebraska

J. W. Yant, Wyoming Stream Pollution Control Advisory Council, Casper, Wyoming

O. C. Yeakley, Swift and Company, Scottsbluff, Nebraska

PROCEEDINGS

OPENING STATEMENT

BY

MR. MURRAY STEIN

MR. STEIN: The conference is open.

The third session of the conference in the matter of Pollution of The Interstate Waters of The North Platte River, involving the States of Wyoming and Nebraska, is being held under the provisions of the Federal Water Pollution Control Act. Under Section 8 of the Act, pollution of interstate waters which endangers the health or welfare of persons in a State other than the one in which the discharges originate, is subject to abatement.

The first step in our procedure is the calling of a conference. Under this Act this conference is one between the State representatives and the representatives of the Federal Government. The purpose of the conference is to bring together the States and the Department of Health, Education, and Welfare, to lay a basis for future action and to give the States, localities and industries an opportunity to take any action which may be indicated under State and local Govt.

local law.

The conference technique, we have found, is a very useful one in getting the States and the Federal Government together and moving forward on segments of river basins to get indicated remedial and corrective action initiated.

I think the North Platte situation has been one of these cases where the conference technique has demonstrated its usefulness. I think we have had two conferences previously dealing with the stretch of the river and the results of the cooperative State and Federal programs have been manifest.

In accordance with the written request dated July 21, 1961, of Dr. E. A. Rogers, Director of Health, Nebraska Department of Public Health, acting in behalf of the Nebraska State Water Pollution Control Council, the Surgeon General called a conference in the matter of pollution of the interstate waters of the North Platte River and its tributaries in Nebraska and Wyoming under the provisions of Section 8 of the Federal Water Pollution Control Act, which was held on September 12, 1961, here in Scottsbluff.

Since the holding of the first session the Congress has amended the Federal Water Pollution Control Act and this and subsequent actions are being held in the name of the Secretary of Health, Education, and Welfare. Following the first session the conferees unanimously agreed to certain conclusions and recommendations, among them the following:

1. That the North Platte River below Torrington, Wyoming, is an interstate stream within the meaning of the Federal Water Pollution Control Act.

2. Th[illegible]tion of interstate waters subject to abatement under the Federal Water Pollution Control Act is occurring in this stretch of the North Platte River.

3. That discharges of industrial wastes from a plant in Torrington, Wyoming, sewage from Lyman, Morrill, Scottsbluff, Gering, Minatare, Melbeta, Bayard, Bridgeport, Nebraska, and industrial wastes from plants at Mitchell, Gering, Scottsbluff, Bayard and vicinity, pollute this stretch of the river so as to interfere with aquatic life, use of the river for recreation, fishing, boating, esthetic enjoyment, and as a potential source of municipal and industrial water supply.

Opening Statement - Mr. Stein

A second session was called by the Chairman following completion of the cooperative investigation and study made by the Federal and State agencies, and the municipalities and industries involved. That session was held on March 21, 1962, at Cheyenne, Wyoming. Among the conclusions and recommendations reached by the conferees were the following:

1. That the Holly Sugar Company at Torrington, Wyoming, will proceed with the necessary pipeline pumping and percolation pond or equivalent to provide for the disposal of sewage and industrial wastes in order to keep out of the river pulp, silo drainage and septic tank discharges and to devise a method for efficient screening of the final waste effluent. These remedial facilities are to be in operation by the beginning of 1962-63 sugar beet campaign. The Nebraska State Department of Health will provide an effective program to control pollution of the North Platte River in Nebraska and a program for sampling, analyzing and monitoring the effects of discharges from the industrial sources on the river from Torrington, Wyoming, to Broadwater, Nebraska, and will be established and in operation

by the beginning of the 1962-63 sugar beet season. The program will include but not be limited to analysis of the dissolved oxygen, B.O.D. suspended solids, and the nature of the bacteria present.

At the end of the 1962-63 sugar beet season all parties concerned will evaluate the accomplishments and effectiveness of the program agreed upon with a view to determining the need for another session of the conference. According to the information we have had there has been, as far as we can determine -- and this is, of course, subject to statements which will be made here -- the most complete cooperation from the State agencies concerned, from the Holly Sugar Company at Torrington, which, as far as I know, has followed through and done everything that was agreed on at the last session of the conference; and, as far as we can tell, certainly, a commensurate program was established in Nebraska, particularly by the Great Western Sugar Company in its installations there.

However, as I understand, the Scottsbluff municipal plant has gone forward. When the technical people got together to evaluate the results, there were certain questions they felt still had to be resolved, and the technical people made the recommendation that we have another session of the conference, and this recommendation was carefully checked. It was agreed on by the Public Health Service technical people and by the technical people of both States concerned, and consequently this conference was called.

I think we have a situation here in this conference where we can recognize that we are well along and that considerable progress has been made and is being made. I think this is kind of a point in the operations where we have to look and see if we are going in the right direction, if we are going fast enough, if we are going far enough, or anything else that has to be done.

We would like to point out that under the law this is a conference between the Department of Health, Education, and Welfare and the States of Nebraska and Wyoming. Under the law the States can bring anyone they wish to the conference to participate and assist the conferees in arriving at conclusions.

The conferees today are Dr. E. A. Rogers of the Nebraska Department of Health;

Mr. John S. Samson of the Nebraska Water Pollution Control Council;

Dr. James W. Sampson of the Wyoming Department of Public Health; and

Arthur E. Williamson of the Wyoming Department of Public Health.

Mr. Herbert Clare, who is the Regional Program Director for the Water Pollution Control Program of the Department, with headquarters in Kansas City, Missouri. Mr. Clare is the conferee for the Federal Government.

My name is Murray Stein from the Department of Health, Education, and Welfare, with headquarters in Washington, D. C.

A word about our objective at this stage in a conference of this kind.

I think the key point from both the Federal and State point of view -- although facetiously sometimes reference is made to the point that once the Federal Government gets in it does not ever get out -- the key point is that in a number of proceedings the Federal Government disengages itself and turns the problem back to the State agencies for continued surveillance as soon as we practicably can. This is our objective. I think our record shows that we have disengaged from many, many cases, and they are proceeding in a satisfactory way, where the people are dealing with the States. I think it is part of the genius of the American system of government that we can go through this kind of transition, that is, the kind of transition where we have one party succeeding to control of a municipal, State or Federal office and taking the place of another party. A lot of governments find this transition very difficult. We seem to manage it.

By the same token, I think one of the difficult jobs we have is a transition where the Federal Government is in a pollution case and hopes or sees the way clear where we can withdraw and the State agencies can handle the problems from there on. I think this is one of the areas that we should direct ourselves toward, and I think that this is a major area.

In past conferences we have found it most helpful to call on each of the conferees to make a statement. Their invitees will also be called upon to make statements. At the conclusion of each statement, the conferees will be given an opportunity to ask questions or make comments, and at the conclusion of this procedure we will have a general discussion and then try to summarize and determine what conclusions can be made.

A word about the procedures governing the conduct of the conference. A verbatim transcript is being made of the conference to give us a record of what is being said and done here to enable us to prepare a summary. This transcript as well as the summary of the conference discussions which, by law, we are required to prepare, will be made available to the State water pollution control agencies represented at the conference. Any others interested in obtaining copies of the summary or the transcript should get in touch with their State water pollution control agency.

We would suggest that persons who are called to make statements come up to the lectern to speak, or to the front of the room, so we can hear them.

Since Dr. Rogers is not here yet, we might take this opportunity to ask you, Mr. Clare, if you have anyone you want to introduce.

STATEMENT OF HERBERT C. CLARE, UNITED STATES PUBLIC HEALTH SERVICE, KANSAS CITY, MISSOURI

MR. CLARE: Yes, there are several introductions I would like to make.

Mr. Stein has indicated that this is a conference on an interstate stream. It is also interregional, and with us today, representing Region VIII of the Public Health Service is the Chief of the Water Supply and Pollution Control, Lester M. Klashman.

There are several people here representing Federal agencies that I should like to introduce too, Mr. Chairman.

Representing the Regional Director of the Bureau of Reclamation from Denver is Mr. E. A. Jarecki.

Also representing the Bureau of Reclamation is a man who was with us at the first conference here at Scottsbluff, Mr. R. M. Sensintaffar, Area Engineer. Mr. Sensintaffar will have a statement to make a little later.

Representing Mr. Burrell, Regional Director of the National Park Service, is Mr. Keith E. Miller, Superintendent of the Scottsbluff Monument.

H. C. Clare

With us again is Mr. Albert S. Kosselman of the Bureau of Mines in Denver.

Representing the Fish and Wildlife Service out of Grand Island, Nebraska, is Ray C. Williams.

These are all the introductions I have, Mr. Chairman.

MR. STEIN: Dr. Sampson.

STATEMENT OF DR. JAMES W. SAMPSON, WYOMING DEPARTMENT OF PUBLIC HEALTH, CHEYENNE, WYOMING

DR. SAMPSON: Mr. Frank Long of the Wyoming Stream Pollution Control Advisory Council. It is a pleasure to have Frank with us from Buffalo, Wyoming.

We have also three members of the Stream Pollution Council, Mr. Joe Yant and Mr. Bill Gibson.

We also have the Commissioner of Agriculture for the State of Wyoming, Otto Engendorff, who is a member of this Commission.

We have two members of our Game and Fisheries Department, Cliff Bosley, but I don't know the other man's name.

Cliff, would you introduce him?

MR. BOSLEY: Bob Millis, Lander, Wyoming.

DR. SAMPSON: Having had my grandfather, John Samson, take me into camp last time, I brought an attorney with me today. We have Mr. Dean Borthwick, who is Deputy Attorney General of the State of Wyoming.

We also have, as you can see by the sign, Arthur Williamson, State Sanitary Engineer for the Wyoming

Department of Public Health, and he has as a member of his staff, Frank Harman. Mr. Harman has not been with the Department too long. He is Burmese and he is finding this country out here a little different from the jungles from where he came.

We also have representing the industry involved in this area Mr. Earl Browning of Colorado Springs. Mr. Browning, do you have someone else with you?

MR. BROWNING: I had a lawyer, but he didn't show up.

DR. SAMPSON: You can use ours.

MR. STEIN: Thank you.

MR. SAMSON: In response to Dr. Sampson, apparently I have grown older a few years here. Last time I was his father. This year it is grandfather. I want to congratulate the Doctor also for having the influence with our Democratic Administration and I want to congratulate him in having successfully recommended to the President for appointment to the Water Pollution Control Advisory Council in HEW Mr. Burwell, whom many of us know here. He is a citizen of Casper, Wyoming. I think he attended one or two of our sessions.

Is he here now?

DR. SAMPSON: He isn't here today.

STATEMENT OF JOHN S. SAMSON, NEBRASKA WATER POLLUTION CONTROL COUNCIL, OMAHA, NEBRASKA

MR. SAMSON: It is my pleasure to say to you that Harold Burk is General Manager of the Great Western Sugar Company, and is with us here today.

We also have Mr. T. A. Filipi from Lincoln.

My good friend, Dr. Rogers, is coming here on the train and will be here in the next five or ten minutes.

I see Bill Schoenecker and Dick Peckham. Would you kindly rise and identify yourselves?

Have I missed anyone else from Nebraska?

Harold's cohort from Denver, Colorado, I believe General Manager of the Great Western Sugar Company, Lloyd Jensen, and also on the National Industrial Task Force, is here with us, and we are glad to see you, Lloyd.

I believe that is all.

I do want to say that I am very happy to see you back again, Dr. Sampson.

DR. SAMPSON: Referring to the President's Advisory Council, Mr. Long was succeeded by Mr. Burwell, so we are keeping things in Wyoming. If we could keep more water there, we would be all right.

MR. STEIN: Mr. Samson of Nebraska also served a term on the President's Water Poll tion Control Advisory Board, so we are indeed well represented here, and I can see these meetings are getting better all the time. We are getting more and more lawyers coming to them. Maybe next time Holly will bring their lawyer, and we will be all set.

MR. SAMSON: I think they brought their lawyer, but they lost him someplace.

DR. SAMPSON: It looks to me as if there must be something in it, or there wouldn't be so many lawyers around.

MR. STEIN: I think we can proceed, Mr. Clare, and for the record, I don't think it will do any harm for Dr. Rogers, because the report will be presented at first, I think, and the report has been supplied to the Nebraska health authorities for their analysis.

Mr. Clare?

MR. CLARE: The interest of the Public Health Service in this problem of water quality in the North Platte River is a matter of record, I think, in the previous transcripts of our first two sessions of the conference. As Mr. Stein said, the technical staffs in their study last June felt that there were several matters that the conference itself should consider and make decisions on, instead of the technical staff taking this on themselves. So that is the purpose, of course, for this session of the conference, to try to tie up these loose ends and have the technical staff present the results of the surveys that were made last June, and also the spot-checks that were made this fall after the beet campaign started.

So to start this off, I would like to introduce Mr. Donald A. Townley, an engineer, Public Health Service engineer, who is in charge of enforcement -- his title is Chief, Enforcement Section, in the Public Health Service, of Region VI, in Kansas City.

STATEMENT OF DONALD A. TOWNLEY, CHIEF, ENFORCEMENT SECTION, UNITED STATES PUBLIC HEALTH SERVICE, REGION VI, KANSAS CITY, MISSOURI

MR. TOWNLEY: Mr. Chairman, conferees, gentlemen: I have two reports, Mr. Chairman. One has been prepared from the study which you alluded to in your introduction and is the one Mr. Clare referred to.

I would like further to acknowledge the fine help we had by the States of Wyoming and Nebraska in the preparation of this report, not only from the State Health Departments, but people who are interested in the report -- industry in particular was also very helpful and very cooperative.

Now, Mr. Chairman, this was presented to the principal interested parties back in June. It has been circulated to the conferees ahead of time and the second report will more or less bring this one up to date. So I recommend at this time that this be inserted into the record and that we go ahead to the supplemental report.

MR. STEIN: Without objection, that will appear in the record as read.

(The report referred to is as follows:)

REPORT OF SURVEY, NORTH PLATTE RIVER, TORRINGTON, WYOMING - BRIDGEPORT, NEBRASKA - NOVEMBER 30 - DECEMBER 6, 1962

BY

PUBLIC HEALTH SERVICE REGIONS VI & VIII
WYOMING DEPARTMENT OF PUBLIC HEALTH
NEBRASKA DEPARTMENT OF HEALTH

SECTION I

CHEMICAL AND BACTERIOLOGICAL

ACKNOWLEDGEMENTS

The assistance of several agencies, industries, and individuals in planning this survey was invaluable (see Page 4).

Laboratory facilities, with staff, were provided by the Public Health Service Sanitary Engineering Center, with assistance being rendered by the Western Branch of the Nebraska State Health Department Laboratories.

Samples were collected by personnel from the Nebraska Department of Health, Section of Environmental Health, and from Regions VI and VIII of the Public Health Service.

The Wyoming State Hydrographer provided flow data for the Wyoming stations; and the Nebraska Department of Water Resources provided flow data for the Nebraska River stations. Flow data for the Nebraska industrial sampling points were computed by the Nebraska Department of Health.

The State Sanitary Engineers of Wyoming and Nebraska reviewed the report prior to distribution, as did representatives of the Sanitary Engineering Center and Region VIII of the Public Health Service.

REPORT ON
NORTH PLATTE RIVER SURVEY
WYOMING-NEBRASKA
NOVEMBER AND DECEMBER, 1962

BACKGROUND

There is a long history of water quality surveys for the reach of the North Platte River extending from Torrington, Wyoming, downstream to Broadwater, Nebraska. Recent surveys were made in 1960, 1961, and 1962.

In December of 1960, studies were made to determine the effects of wastes on bacteriological, chemical and physical qualities of the North Platte River. In November of 1960, a biological survey of the river was made for the reach between Torrington, Wyoming, and Mitchell, Nebraska. An additional biological study was made during August of 1961, involving the reach of the river from Torrington.

3mr

Wyoming, to Bridgeport, Nebraska. The purpose of these studies was to determine whether or not the stream was polluted in Nebraska, and to locate the sources of pollution, as well as to determine the effects on downstream water uses.

As a result of these studies and at the request of the Nebraska State Health Department, a Conference was called by the Secretary of the Department of Health, Education, and Welfare on September 12, 1961, at Scottsbluff, Nebraska. This Conference was held in accordance with the provisions of the Federal Water Pollution Control Act. The conferees recommended in part that "the Public Health Service, in cooperation with State agencies, municipalities and industries involved, will conduct an investigation and study of the River during the current 1961-1962 beet sugar campaign to obtain bacteriological, biological, chemical, streamflow, and other pertinent data to properly assess the sources of industrial and municipal wastes, the kinds of coliform bacteria present in the River, and the effects on water quality."

To comply with this recommendation it was necessary to study the reach of the river involved prior to and during the 1961-1962 beet sugar campaign. Accordingly, in September and again in November 1961, the Public Health Service in cooperation with the States of Wyoming and

D. A. Townley

Nebraska conducted stream studies to obtain the necessary data for properly evaluating the effects of industrial and municipal wastes on the North Platte River. Information obtained in these surveys was published in a report dated February 1962.

The second session of the Conference in the matter of pollution of the interstate waters of the North Platte River, Wyoming-Nebraska, was convened on March 21, 1962, at Cheyenne, Wyoming, to consider the data obtained from the river studies completed in September and November 1961. The conferees of this second session heard statements pertaining to the reach of the river under consideration. These statements were presented by the States involved, various industries and municipalities. In addition, the September-November 1961 report was presented by the Public Health Service. On the basis of the information presented, the conferees recommended, among other things, that:

> "A program for sampling, analyzing and monitoring the effects of discharges from the industrial sources on the River from Torrington, Wyoming, to Broadwater, Nebraska, will be established and in operation by the beginning of the 1962-1963 beet sugar campaign. The program will include but not be limited to analysis of dissolved

5mr

"oxygen, BOD, suspended solids and the nature of bacteria present.

"The Federal Government has an obligation in connection with that program, but industry should be given an opportunity to inaugurate and conduct this activity in cooperation with the State water pollution control agencies. Accordingly, the Wyoming Department of Public Health and the Nebraska Department of Health will furnish the Department of Health, Education, and Welfare details of the program by August 1, 1962, so that the Department of Health, Education, and Welfare can evaluate the situation.

"It is understood that the Department of Health, Education, and Welfare will be called upon in the event the monitoring program indicates the presence of fecal streptococci or fecal coliforms."

To facilitate the implementation of this monitoring program, a meeting of representatives of concerned agencies and industries was arranged by the Nebraska State Sanitary Engineer, for the purpose of discussing and formulating a cooperative plan to monitor the North Platte River between Torrington, Wyoming, and Broadwater, Nebraska

D. A. Townley

This meeting was held at the City Hall, Scottsbluff, Nebraska, on September 12, 1962, with the following in attendance:

Lee Hall	Radio Station KOLT	Scottsbluff
H. D. Burk	Great Western Sugar Company	Scottsbluff
J. E. Browning	Holly Sugar Corporation	Colorado Springs
Oscar Wieberg	Scotts Bluff County Health Department	Gering
Don Christensen	Scottsbluff Star-Herald	Scottsbluff
T. H. Vanderhoof	West Nebraska Branch Laboratory	Scottsbluff
J. W. Fitzpatrick	U. S. Public Health Service	Denver
A. E. Williamson	Wyoming Dept. of Public Health	Cheyenne
T. A. Filipi	Nebraska Dept. of Health	Lincoln
D. A. Townley	U. S. Public Health Service	Kansas City
R. G. Hunsinger	U. S. Public Health Service	Kansas City
F. W. Kittrell	U. S. Public Health Service	Cincinnati

A general plan regarding the sampling stations, analyses to be performed, assignment of responsibilities and other general functions was agreed upon by participants at the meeting.

SCOPE OF SURVEY

A monitoring survey for the reach of the North Platte River between Torrington, Wyoming, and Bridgeport, Nebraska, was planned and conducted by the Public Health Service and the States of Wyoming and Nebraska in late 1962. The survey was designed to obtain data for evaluating improvement in river water quality following the construction of pollution abatement facilities by municipalities and industries subsequent to the 1961 survey. This survey was conducted as nearly as possible in conference with procedures followed in preceding surveys.

The sampling stations selected were at the same locations with the same numerical designations as those of the 1961 survey. Since this was a monitoring survey, it was decided that not all previous stations needed to be sampled; accordingly, only those deemed necessary to reflect the general condition of the river were utilized (See Table I). Figure 1 shows the comparative locations of the sampling points and sources of wastes.

While the number and type of analyses to be

MONITORING SURVEY
NORTH PLATTE RIVER SURVEY

TORRINGTON, WYOMING
TO BRIDGEPORT, NEBRASKA
NOVEMBER-DECEMBER 1962
FIGURE 1

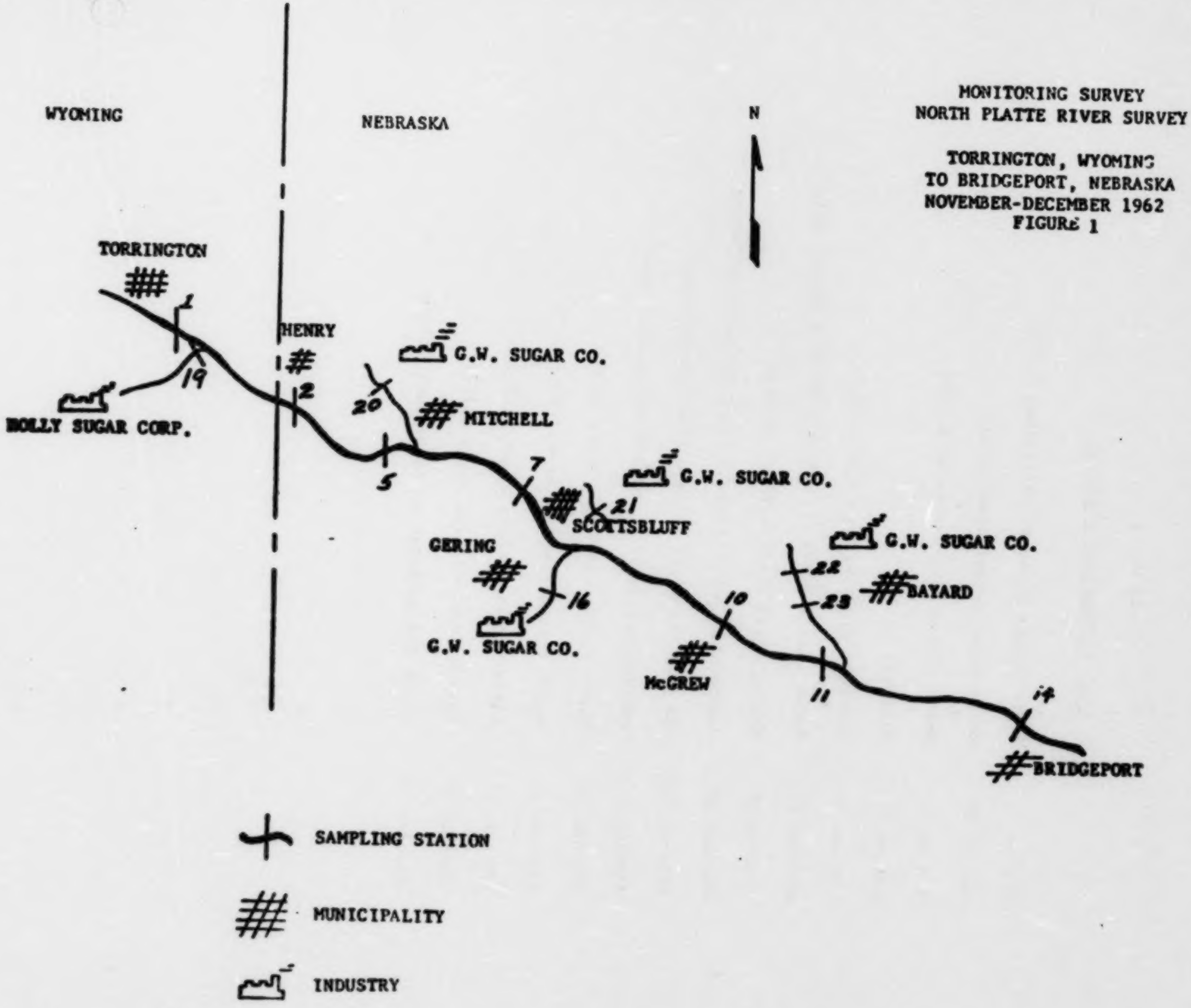

WYOMING
NEBRASKA
N
TORRINGTON
1
19
HOLLY SUGAR CORP.
HENRY
2
G.W. SUGAR CO.
20
MITCHELL
5
7
G.W. SUGAR CO.
21
SCOTTSBLUFF
GERING
16
G.W. SUGAR CO.
G.W. SUGAR CO.
22
23
BAYARD
10
McGREW
11
14
BRIDGEPORT
SAMPLING STATION
MUNICIPALITY
INDUSTRY

TABLE NO. I

List of Sampling Stations

Station 1	North Platte River at Torrington Bridge
Station 19	Holly Sugar Corporation outfall
Station 2	North Platte River at Henry Bridge
Station 5	Mitchell Bridge
Station 20	Mitchell Great Western Plant outfall
Station 7	North Platte River at Scottsbluff 20th Street Bridge
Station 16	Gering Great Western Plant outfall
Station 21	Scottsbluff Great Western Plant influent to lagoon
Station 21W	Scottsbluff Great Western Plant outfall West
Station 21E	Scottsbluff Great Western Plant outfall East
Station 10	North Platte River at McGrew Bridge
Station 11	North Platte River at Bayard Bridge
Station 22	Bayard Great Western Plant influent
Station 23	Bayard Great Western Plant outfall
Station 14	North Platte River at Bridgeport Bridge

performed were somewhat limited by the laboratory facilities available, it was determined that the following analyses would be adequate to provide a basis for judging material changes in the North Platte River water quality:

Dissolved Oxygen
Biochemical Oxygen Demand
Suspended Solids
Suspended Volatile Solids
MPN
Fecal Coliform
Fecal Streptococci

All but two of the analyses were performed in accordance with "Standard Methods for the Examination of Water and Waste Water," eleventh edition, 1960. The two exceptions were examinations for fecal coliform and fecal streptococci as adapted for water pollution studies. In addition to these determinations, a biological evaluation of aquatic life in the stream was scheduled. (See Section II).

The upper and lower extremities of the stream to be considered were Torrington, Wyoming and Bridgeport, Nebraska, respectively.

THE SURVEY

The chemical and bacteriological portion of the survey was conducted during the seven-day period from November 30 through December 6, 1962. The samples were collected by Region VI and VIII of the Public Health Service and the Nebraska Department of Health. Two of the four people assisting in sample collection also collected samples during the September-November 1961 survey.

Laboratory facilities were provided by the Public Health Service, Sanitary Engineering Center, by stationing a mobile laboratory at the City Hall, Scottsbluff, Nebraska. This laboratory was staffed by a chemist and bacteriologist from the Public Health Service (the bacteriologist also performed similar analyses during the September-November 1961 survey). Assistance in laboratory determinations was provided, as needed, by the Nebraska West Branch Laboratory.

River samples were "grab samples" collected daily at each river station. Composite samples were collected daily at each beet sugar plant waste line and at the effluent from the Bayard Great Western treatment device. The composite was made up of three portions collected at approximately two-hour intervals, beginning about 8:00 a.m.

HYDROLOGIC DATA

North Platte River streamflows (Table II) were determined by the State Hydrologist, Torrington, Wyoming; the Nebraska Department of Water Resources, Bridgeport, Nebraska; and the U. S. Geological Survey, Casper, Wyoming.

The Wyoming State Hydrologist made flow determinations on the Holly Sugar Corporation plant outfall (Table III). These determinations were reported as average daily figures compiled from several daily determinations.

The Great Western Sugar Company fabricated and installed a Parshall flume on each waste effluent line. In addition, at each of the two plants (Scottsbluff and Bayard) where waste treatment facilities were in operation, a Parshall flume was installed on the treatment device influent line. Recording instruments were installed at appropriate Parshall flumes and serviced during the entire survey by the Nebraska Department of Health. Waste water flows for the Nebraska plants were computed by the Nebraska Department of Health (Table III).

At the Bayard Great Western plant waste is pumped from the plant waste effluent ditch to the treatment facility. The by-pass line at the pump station noted in the November 1961 survey has not been removed, and at practically every observation was discharging an estimated five to ten percent of the plant waste, with the average approaching the higher figure. The raw waste by-passing

TABLE NO. II - STREAM FLOW DATA IN CFS

Date	Sampling Station Number, Location and River Mile						
	1	2	5	7	10	11	14
	Torrington	Henry	Mitchell	Scottsbluff	McGrew	Bayard	Bridgeport
	208.8	199.0	184.0	177.3	160.2	154.6	141.8
11-30-62	277	320	552	598	893	930	1,100
12-1-62	277	320	552	598	893	930	1,120
12-2-62	277	308	557	603	890	927	1,080
12-3-62	277	320	557	603	891	928	1,110
12-4-62	277	326	543	589	880	917	1,100
12-5-62	277	314	534	580	864	901	1,070
12-6-62	277	320	543	589	875	912	1,080
AVERAGE	277	318	548	594	884	921	1,094

TABLE NO. III - INDUSTRIAL FLOWS IN CFS

Date	Sampling Station Number, Location and River Mile						
	19	20	21[1/]	16	22		23
	Holly Outfall	Mitchell GW	Scottsbluff GW	Gering GW	Bayard GW	Bayard GW By-Pass	Bayard GW
	208.8	184-1.5	173.8-3.0	173-1.5	154.5-2.5	154.5-2.5	154.5-2.0
11-30-62	7.48	16.12	Unknown	12.26	8.0E[2/]	0.6E	0.84
12-1-62	7.22	15.97		12.21	8.0E	0.6E	1.22
12-2-62	7.23	17.21		12.32	8.0E	0.6E	1.24
12-3-62	8.03	16.74		12.40	8.0E	0.6E	1.24
12-4-62	7.11	17.67		12.31	8.0E	0.6E	1.24
12-5-62	6.18	18.14		12.31	8.0E	0.6E	1.24
12-6-62	----	-----		----	8.0E	0.6E	----
AVERAGE	7.21	16.97	Unknown	12.30	8.0E	0.6E	1.17

1/ This is the influent line; there was no effluent

2/ E - Estimated

the treatment facility was discharged to an adjacent irrigation drain and thence to the river.

PHYSICAL OBSERVATIONS

The most significant progress made in cleaning up the North Platte River is the treatment facility operated by the Scottsbluff Great Western beet sugar plant. Wastes from this plant enter two large compartmented holding ponds. The size of these ponds coupled with the high porosity of the soil prevented any controlled discharge from the system during the entire campaign. The levees around the outside of the ponds as well as the partition levees are, however, of a temporary nature and failed on several occasions during the 1962 beet sugar campaign. These failures occurred prior to the survey period.

The Bayard Great Western beet sugar plant treatment facility has been remodeled. The area has been converted to two holding ponds, operating in series, by the construction of a levee around the entire land area, and a partition levee making each pond of approximately the same area. These levees are of a temporary nature and failed on different occasions prior to the 1962 survey. The porosity of the soil in this instance is not nearly as high as that at the Scottsbluff plant. An average of approximately 1.2 cubic feet per second was continuously discharged from this treatment facility. The treatment facility was not as efficient as might be expected. Improper leveling of the bottom of the ponds and failure of the center partition may have resulted in short-circuiting the waste through the system, and certainly minimized the effective capacity of the ponds.

The Holly Sugar Corporation has completed extensive in-plant wasteline modifications, resulting in the removal of all wastes from the river except flume water. Waste lime sludge, Steffens waste, and septic tank effluent are impounded, as are pulp silo under-drain flow and pulp water from the silo separator. These impoundments are large enough to completely contain flows for the entire campaign and have well constructed levees of a permanent nature. Rienks screen dry removal, Link-Belt traveling screen and Link-Belt rotary drum screens (capacity increased 50 percent over 1961) are employed to reduce organic and inorganic particulate matter discharged to the river. The traveling and rotary drum screens are installed in the waste outfall line which contains flume water only, and are of U. S. 40 mesh. Theoretically all particulate matter of 0.0163 inches diameter and larger should be removed from the waste stream. The total volume of liquid waste now being discharged to the river by this plant is approximately 50 percent of the volume discharged in 1961.

It is reported that the Mitchell Great Western and the Gering Great Western beet sugar plants have acquired the necessary land to provide waste treatment facilities.

Present plans are for all other industries along this reach of the North Platte River to discharge their wastes to municipal systems. With few exceptions, the necessary negotiations have been completed (Table IV).

All municipalities on the reach of the North Platte River under consideration, except Bayard, have treatment facilities in various stages of completion (Table IV).

RESULTS OF SURVEY

Since this survey was designed to measure improvement in river water quality following installation of waste treatment facilities, the information is presented as the basis for evaluating progress made in removing pollution from the North Platte River from Torrington, Wyoming, to Bridgeport, Nebraska. Numerical values shown on the graphs which follow are averaged results. The individual results obtained are shown in Appendix A.

The bar graphs which follow show three values for

TABLE NO. IV
SCHEDULE FOR CONSTRUCTION
of
POLLUTION ABATEMENT FACILITIES

(North Platte River - Torrington, Wyo. to Bridgeport, Neb.)
December 6, 1962

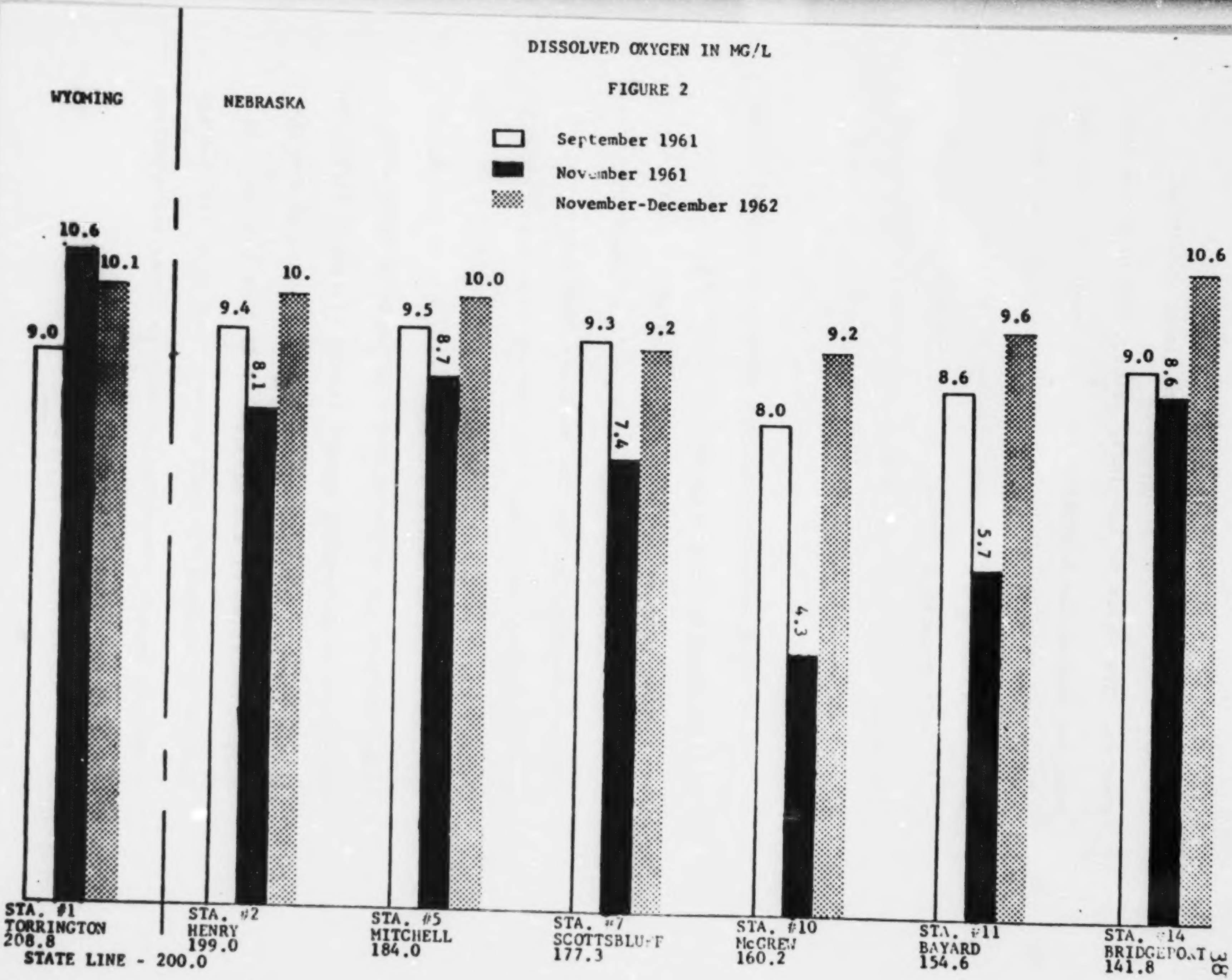
Source[1/]	Status	Estimated Completion Date	Remarks
Wyoming			
Torrington	Completed 1959		Operating
Holly Sugar Corp.	Completed 1962		Operating
Nebraska			
Henry	Completed 1962		Operating
Lyman	Planning		
Morrill	Planning		Final plans approved
Mitchell	Planning		Final plans approved
G.W. Sugar Co.	Site acquired		No construction
Scottsbluff	Completed 1962		Not operating
G.W. Sugar Co.	Completed 1962		Operating
Terrytown	Planning		
Gering	Planning		
G.W. Sugar Co.	Site acquired		No construction
Minatare	Planning		
Melbeta	Completed		Operating
Bayard			No progress
G.W. Sugar Co.	Remodeled 1962		Operating
Bridgeport	Planning		
Broadwater	Planning		

[1/] Industrial waste to municipal system except as noted.

each river station and two values for each industrial station. The value on the left, center, and right is that obtained during the September 1961, November 1961, and the current survey respectively for the river stations. Only two values are shown for each industrial station.

Figures 2 through 14 show results obtained at the seven river stations, and the information for Figures 15 and 20 was obtained from the beet sugar plants along the reach of the river under study.

Figure 2 indicates the average dissolved oxygen in river samples in milligrams per liter (mg/1) for the three study periods, September 1961, November 1961, and November-December 1962 respectively. The lowest dissolved oxygen concentration for the November 1961 survey was 4.3 mg/1 at McGrew, Nebraska. The average figure at McGrew in 1962 was 9.2 mg/1. In examining the graph, it is noted that pollution abatement measures initiated by the Holly Sugar Corporation prior to the 1962 campaign have been effective in decreasing oxygen demand of wastes discharged to the river. The 1961 survey indicated that an average oxygen depletion of 2.5 mg/1 occurred from Station 1 to Station 2, whereas the 1962 survey found that the average dissolved oxygen concentration between these two stations remained practically the same.



DISSOLVED OXYGEN IN MG/L

FIGURE 2

D. A. Townley

Figure 3 depicts the comparative biochemical oxygen demand in mg/l, and Figure 4 converts the mg/l to pounds per day (in thousands). Station 1 at Torrington, Wyoming, is directly above the Holly Sugar Corporation waste outlet. Station 2 nine miles downstream reflects an appreciable reduction in BOD carried by the stream over that determined by the 1961 survey. This reduction could have been anticipated in view of the fact that the Holly Sugar Corporation has made significant improvements in its waste disposal program. At present, all wastes, except the flume water, have been eliminated from the plant waste stream. All other wastes are pumped to a system of holding ponds large enough to contain the wastes for the entire beet sugar campaign. These ponds have well constructed levees which are designed to effectively serve for a period of years.

Even though the BOD reduction at Station 2 approaches 50 percent, a large BOD still remains in the stream. The average daily BOD load at Station 2 (Figure 4) was computed from laboratory data (See Appendix A) obtained during the seven-day sampling period. The BOD discharge by the Holly Sugar Corporation (Figure 16) as determined by the analysis of daily composite samplings was found to be approximately 19,000 pounds per day. This

BOD IN MG/L

FIGURE 3

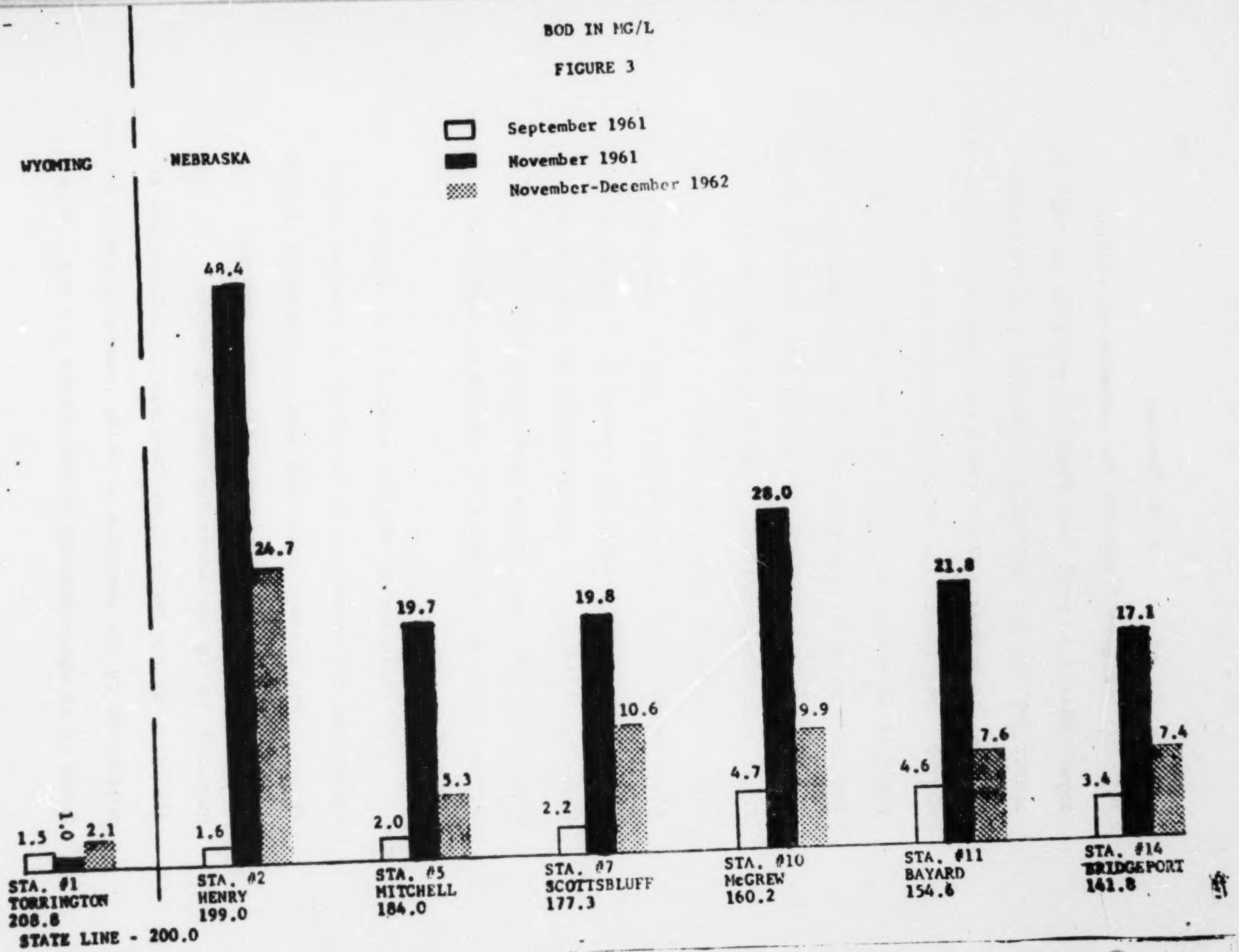


figure was 103,000 pounds per day in 1961; therefore the pollution abatement activities by the company have effected an approximate 81 percent reduction in pounds of BOD contributed to the stream per day. From Figure 4 it is noted that the BOD at Station 1 averaged 3,100 pounds per day. This figure plus the 19,237 pounds BOD per day discharge by the Holly Sugar Corporation makes a total of 22,337 pounds per day which is far short of the 42,000 pounds BOD computed for Station 2. In referring to laboratory data upon which these computations were based it is noted that there was a wide fluctuation in the daily BOD determinations in mg/1 at Station 2. The minimum figure for the seven-day sample period being 10 mg/1 and the maximum figure 56.4 mg/1. Since the samples collected at Station 2 were grab samples, it is quite likely that a longer sampling period would result in an average BOD concentration more nearly approaching the sum of the average figures computed for Stations 1 and 19. Even though the discrepancy between the pounds per day of BOD discharged by the Holly Sugar Corporation and the pounds per day computed for Station 2 is unusually large, the fact remains that the Holly Sugar Corporation is still discharging to the river large quantities of oxygen consuming materials.

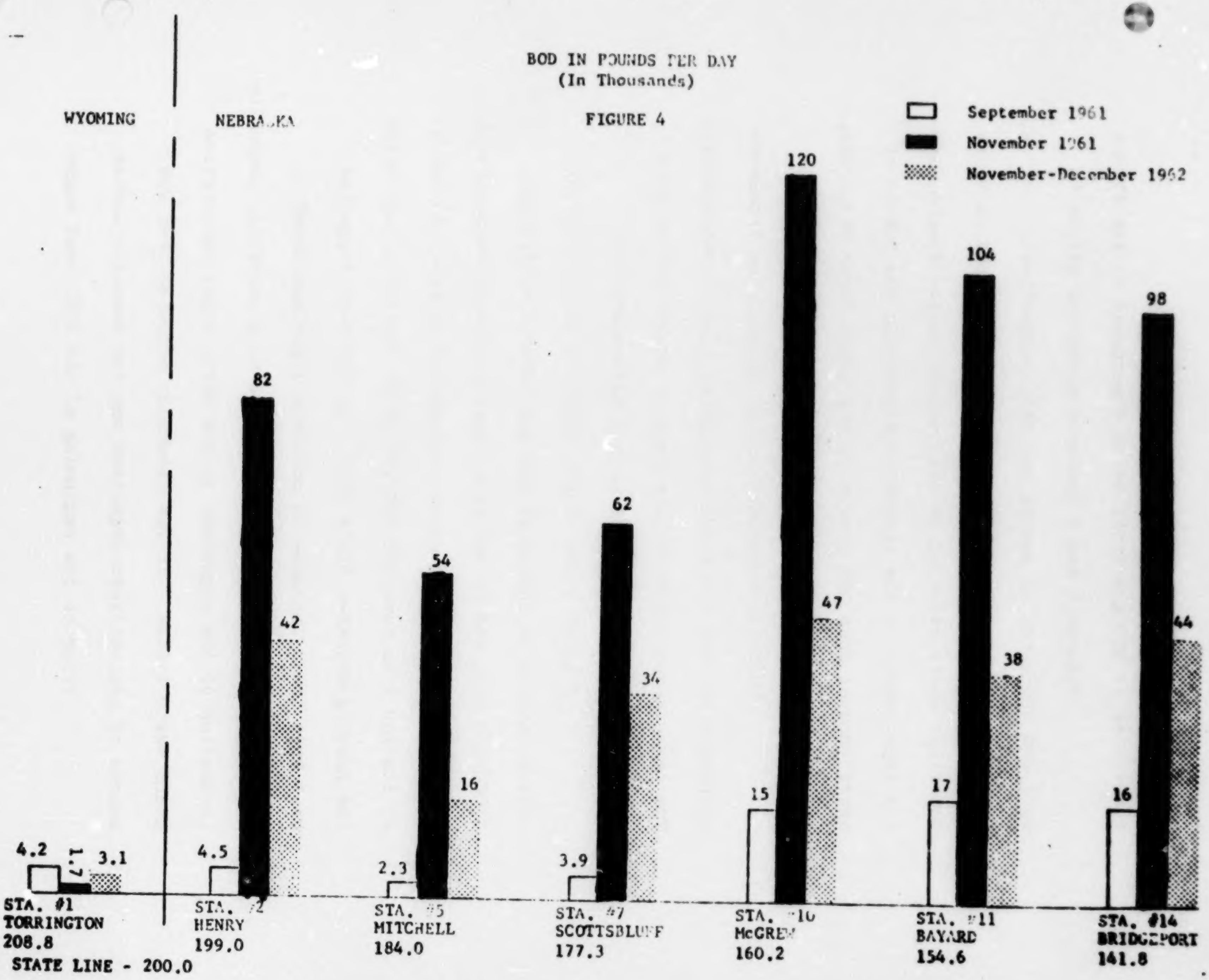
Wastes from the Scottsbluff Great Western Plant were completely impounded by a system of holding ponds during the entire beet sugar campaign except for some loss reported through levee breaks. The ponds are large and are constructed on porous soil. The rate of percolation in the ponds is high as large areas of the holding ponds were not inundated by the wastes. It is doubtful if there would have been a discharge from the system had the levees not failed. The levees, however, are of a temporary nature, apparently constructed by a bulldozer with no compaction. The soil is loose and susceptible to erosion by wave action. Very little leveling was done in the ponds, and clearing was practiced only where a levee was to be constructed.

Even though construction of the system was of a temporary nature, effect of complete waste removal by the Scottsbluff Great Western Sugar plant from the North Platte River was very pronounced. This operation alone removed an estimated 98,970 pounds of BOD per day from the stream (Figure 16).

At the time of this survey, the principal sources of wastes entering the stream, in addition to those already mentioned, were the Great Western Sugar plants at Mitchell, Gering and Bayard, Nebraska, and the municipal area at Scottsbluff, Nebraska. As is evidenced by Figure 4, large

BOD IN POUNDS PER DAY
(In Thousands)

FIGURE 4



quantities of BOD are still being discharged to the stream.

Figures 5 and 6 indicate suspended solids in mg/1 and thousands of pounds per day, respectively. As can be expected, the results are roughly proportional to those described above relating to biochemical oxygen demand, and the improvement in the stream is apparently the result of waste removal from the stream by the Holly Sugar Corporation and the Scottsbluff Great Western Sugar Company.

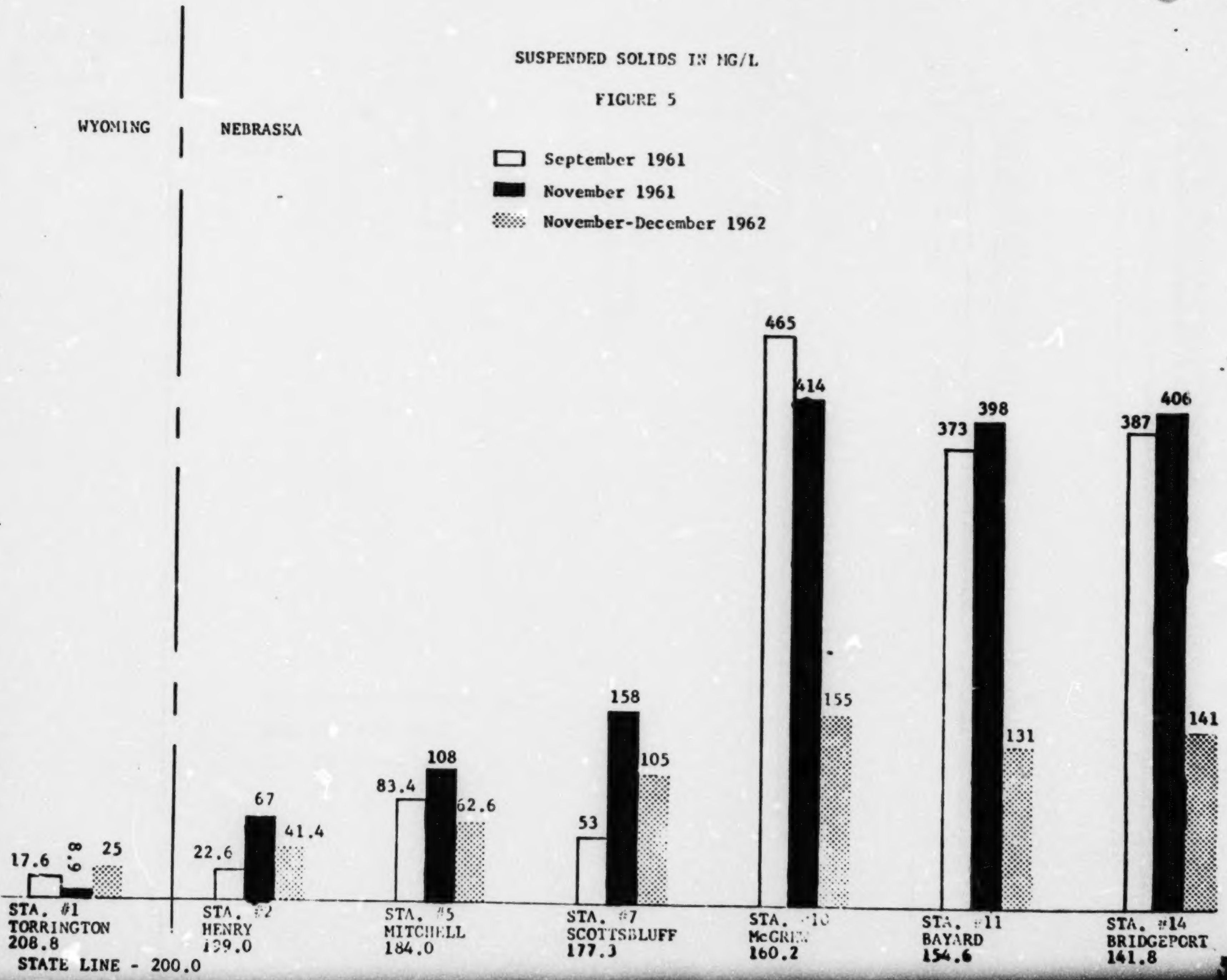
Volatile suspended solids in mg/1 and thousands of pounds per day are shown in Figures 7 and 8 respectively. The improvement noted in this area is comparable to that described for the suspended solids determinations.

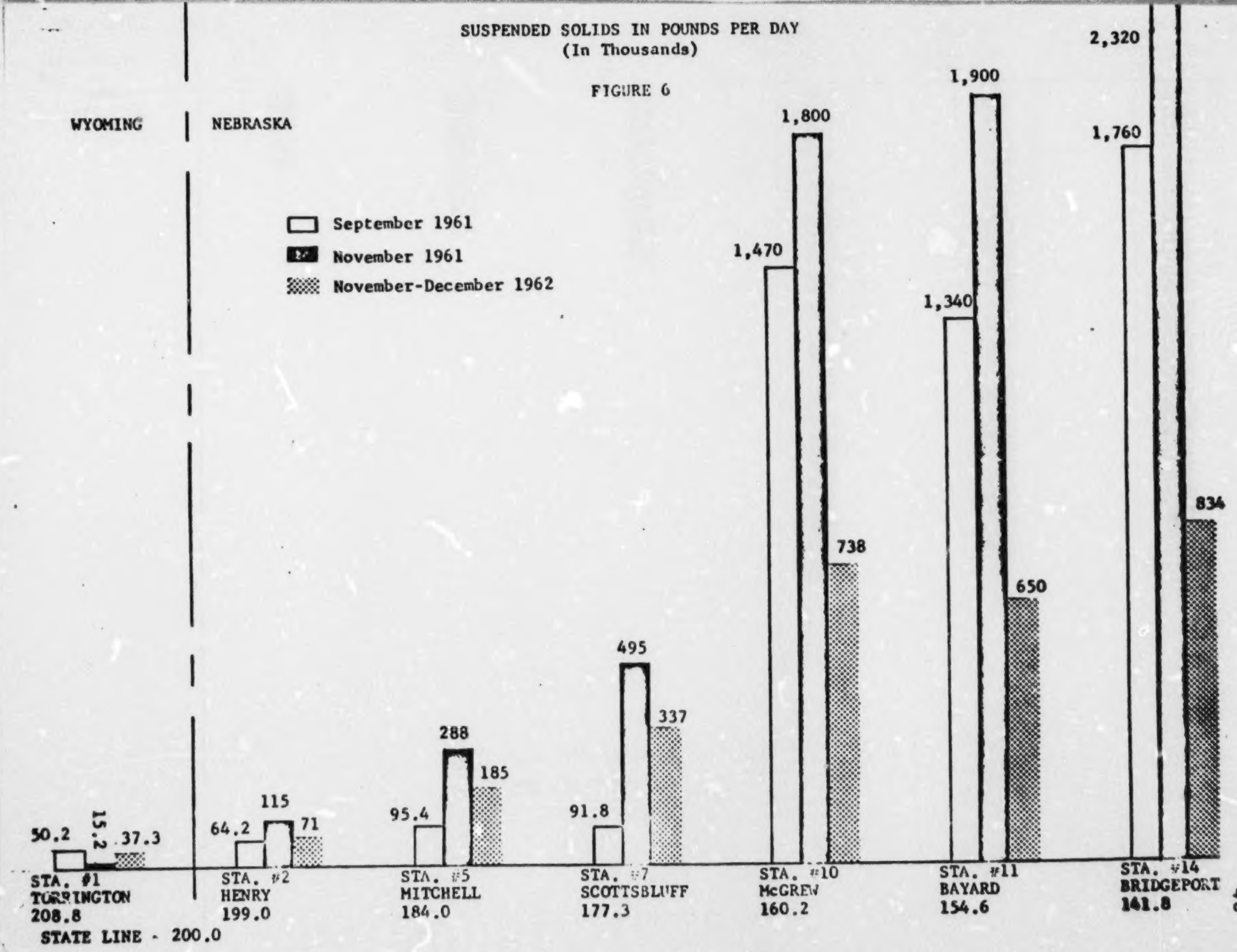
Figures 9 and 10 are based on total coliform determinations in thousands per one hundred milliliters 1,000/100 ml), and in bacterial quantity units respectively. The coliform bacterial count increased from about 60/100 ml at Station 1 to some 112,000/100 ml at Station 2 just below the Wyoming-Nebraska State line. It has been suggested that this large increase in coliform organisms noted in previous surveys, might have been due to a condition promoting incubation of the organisms in the Holly Sugar Corporation plant waste system. It was generally conceded that the source of the coliform organisms was the domestic wastes.

Prior to the beginning of the 1962 beet sugar

SUSPENDED SOLIDS IN MG/L

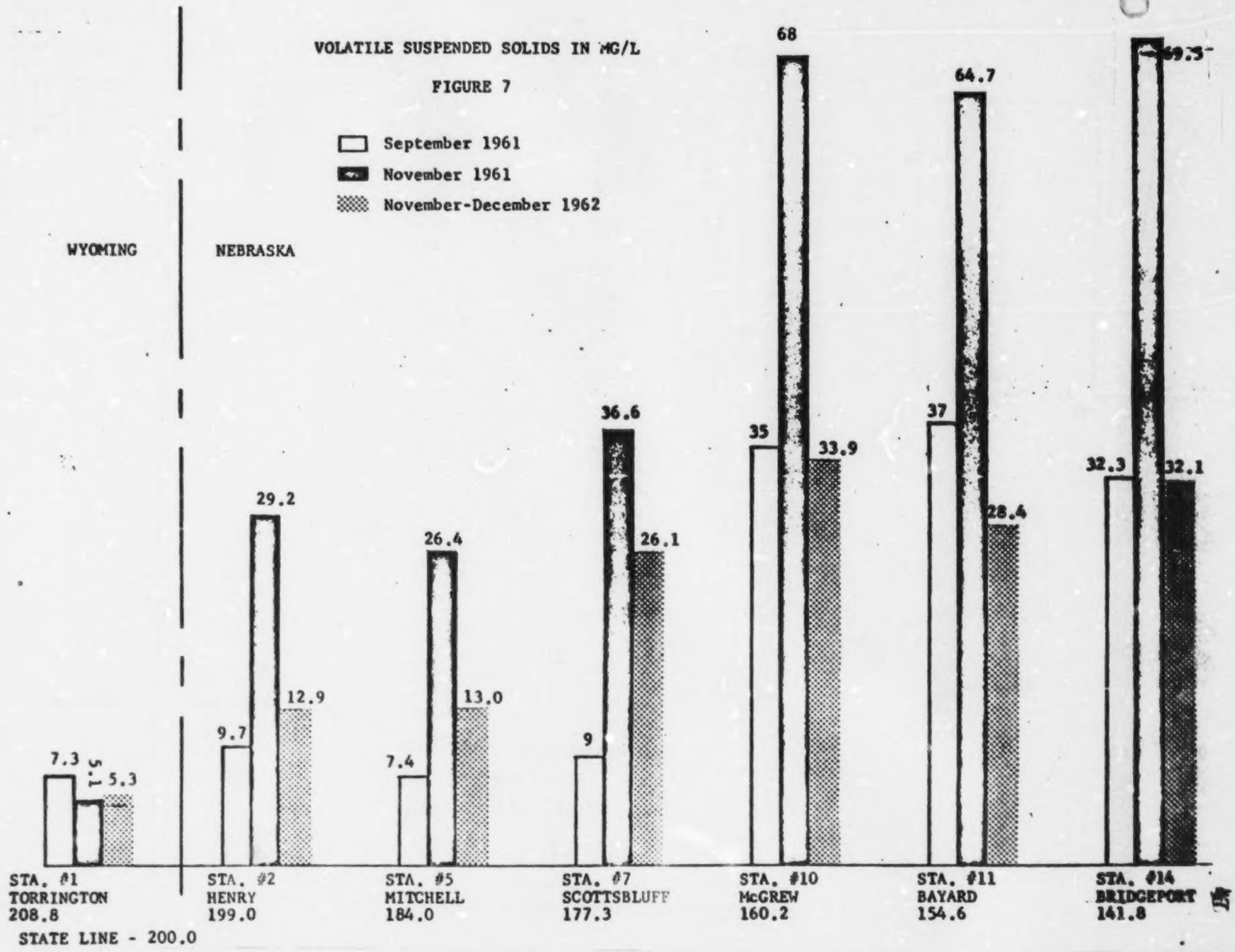
FIGURE 5





SUSPENDED SOLIDS IN POUNDS PER DAY
(In Thousands)

FIGURE 6

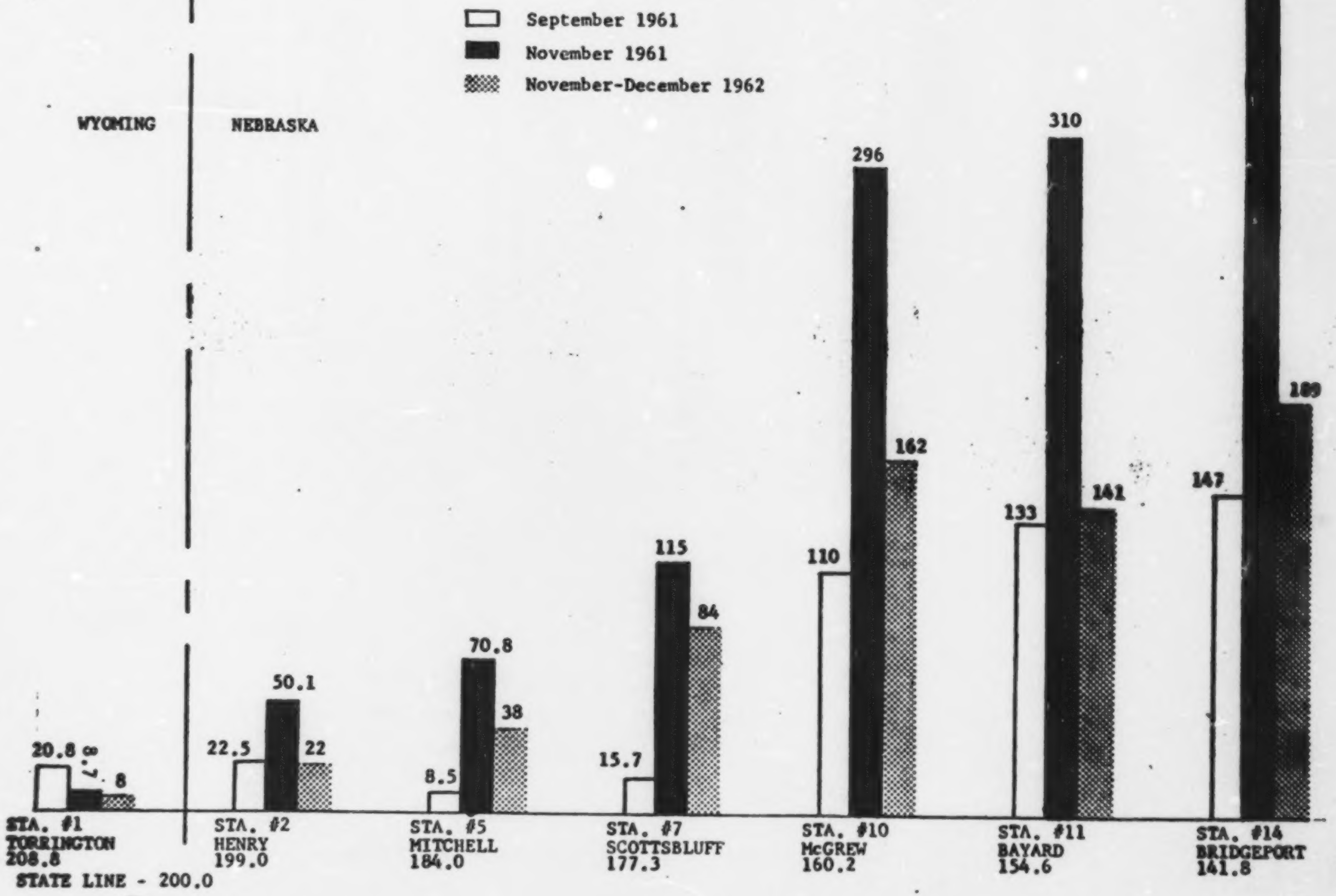


VOLATILE SUSPENDED SOLIDS IN MG/L

FIGURE 7

VOLATILE SUSPENDED SOLIDS IN POUNDS PER DAY
(In Thousands)

FIGURE 8



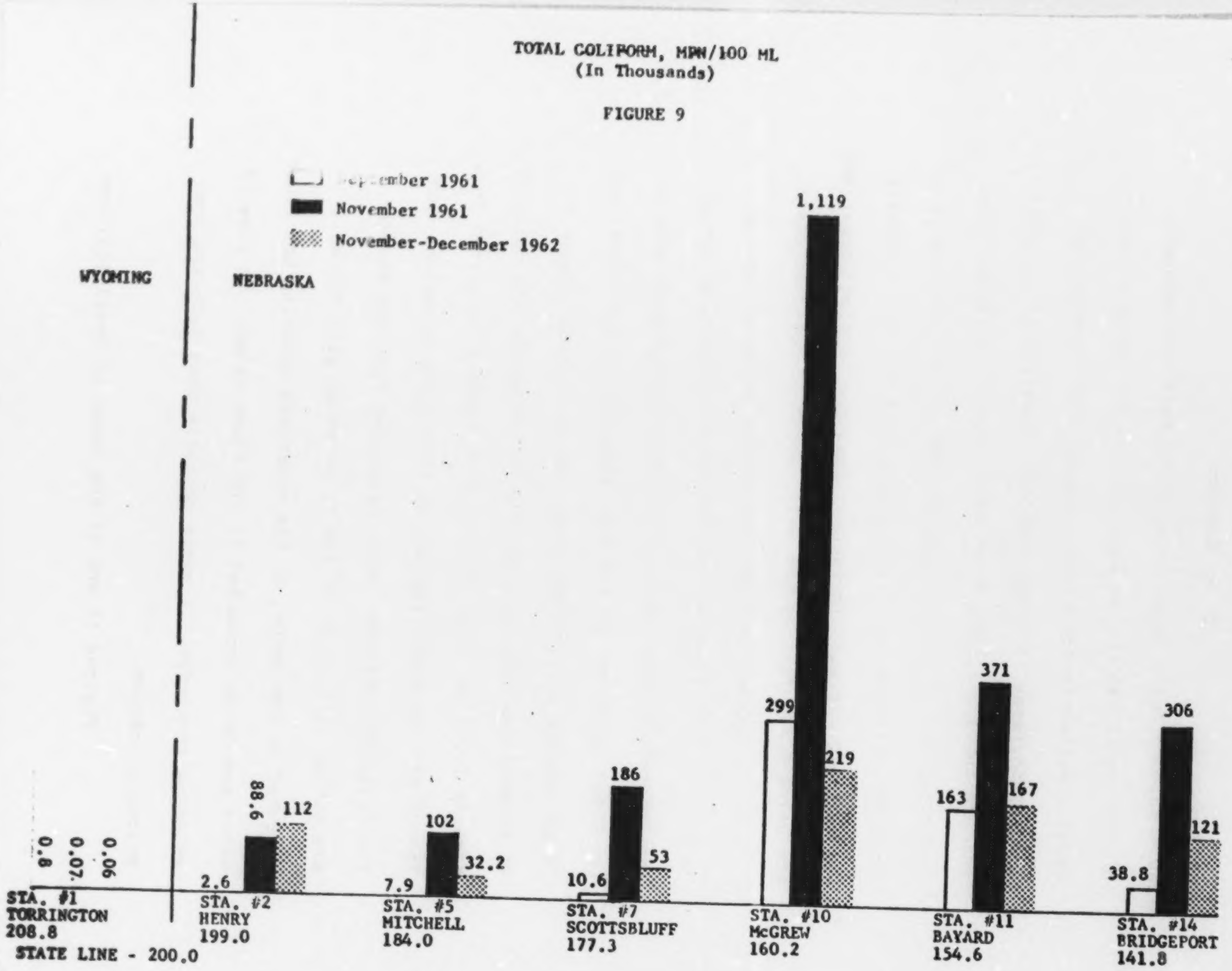
campaign, the Holly Sugar Corporation made the necessary in-plant modifications to preclude the discharge of any domestic wastes to the river. Rather than finding the expected decrease in total coliform, however, it is noted that the total coliform count at Station 2 increased from 88,500/100 ml in 1961 to 112,000/100 ml in 1962 (Figure 9). Since the coliform count at Station 1 is low and increases at Station 2, it must be assumed that the coliform organisms are being discharged by the Holly Sugar Corporation plant.

Samples of sugar beets were collected during this survey and taken to the Sanitary Engineering Center for laboratory examination. Coliform counts were made on the sugar beets and on the soil attached to the beets, and large numbers of coliform organisms were found (Table V). No attempt has been made to date to correlate the coliform numbers found per gram of soil with numbers recovered from the river. It seems logical at this point to assume that the coliform organisms being recovered from the stream are either introduced to the flume water with the soil attached to the beets, or the organisms entering the flume water are being incubated in the flume water. In view of existing knowledge, it seems probable that both are contributory causes.

Figures 11 and 12 are based on fecal coliform

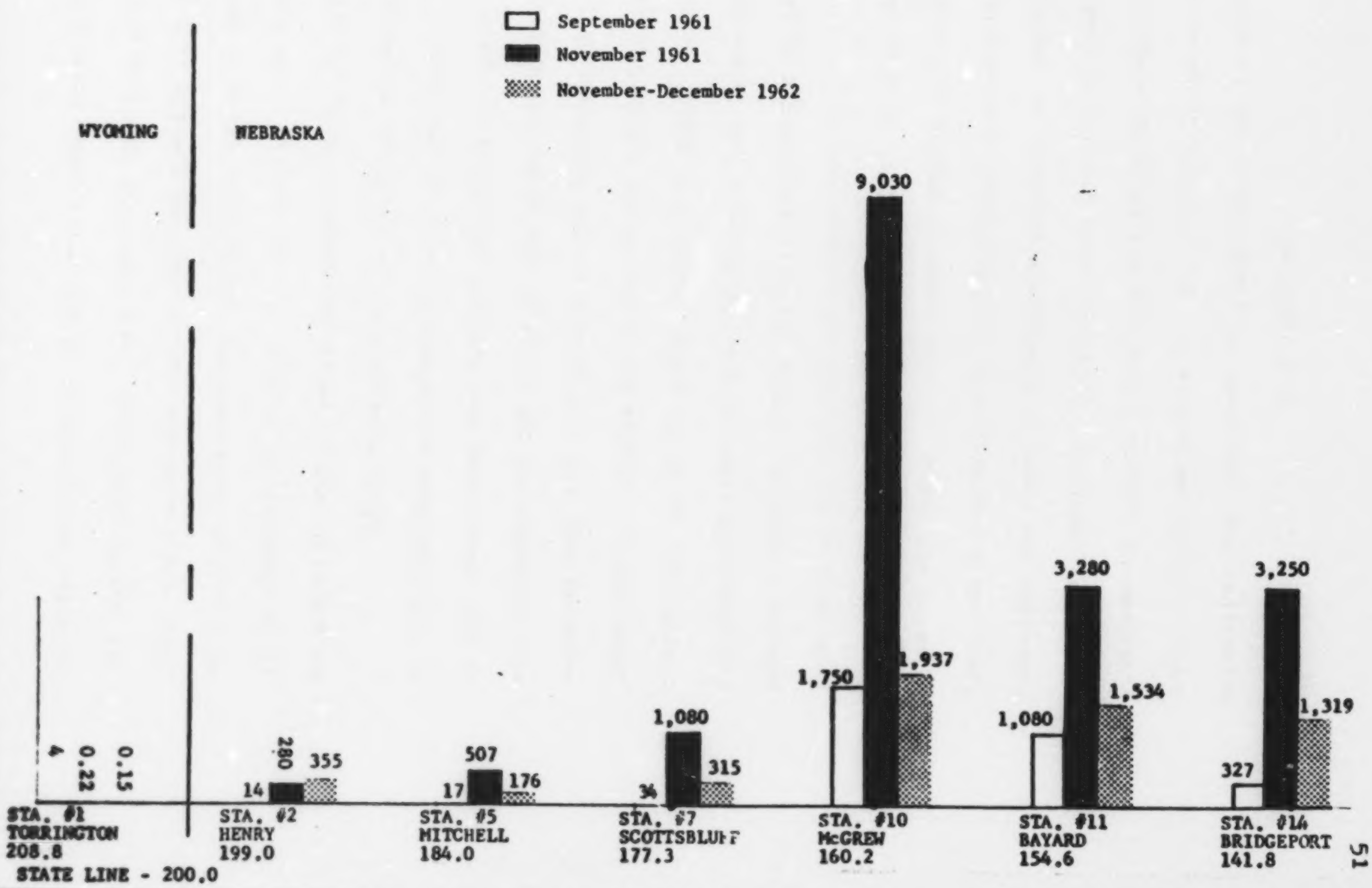
TOTAL COLIFORM, MPN/100 ML
(In Thousands)

FIGURE 9



TOTAL COLIFORM
Bacterial Quantity Units

FIGURE 10



determinations, indicated in 1,000/100 ml and in bacterial quantity units respectively. The increase in fecal coliform organisms at Station 2 over the survey of November 1961 is some fifteenfold. A rather rapid die-off of these organisms was noted in downstream stations to Station 10, where again a significant (approximately a threefold) increase was noted. If the domestic wastes from the Holly Sugar Corporation plant and from the City of Torrington, Wyoming, are not reaching the stream, and if the stream at Station 1 does not contain significant numbers of fecal coliform organisms, it must be assumed that these are coming from the Holly Sugar Corporation plant. Since no known domestic wastes are entering the stream, it is believed that the only source of the organisms is from the soil accompanying the beets to the flume water. Conditions in the flume water are probably conducive to rapid growth of the organisms subsequently found in the river.

Fecal streptococci in 1,000/100 ml are shown on Figure 13, and in bacterial quantity units in Figure 14. It is interesting to note that at Station 2, an average of 1,477,000 organisms per 100 ml were found in November 1961; and during the 1962 survey, an average of 1,344,000 per 100 ml were found. The reduction expected following in-plant modifications by the Holly Sugar Corporation plant

TABLE NO. V
BACTERIOLOGICAL RESULTS OF LABORATORY EXAMINATION
of
SUGAR BEET SAMPLES COLLECTED DECEMBER 1962

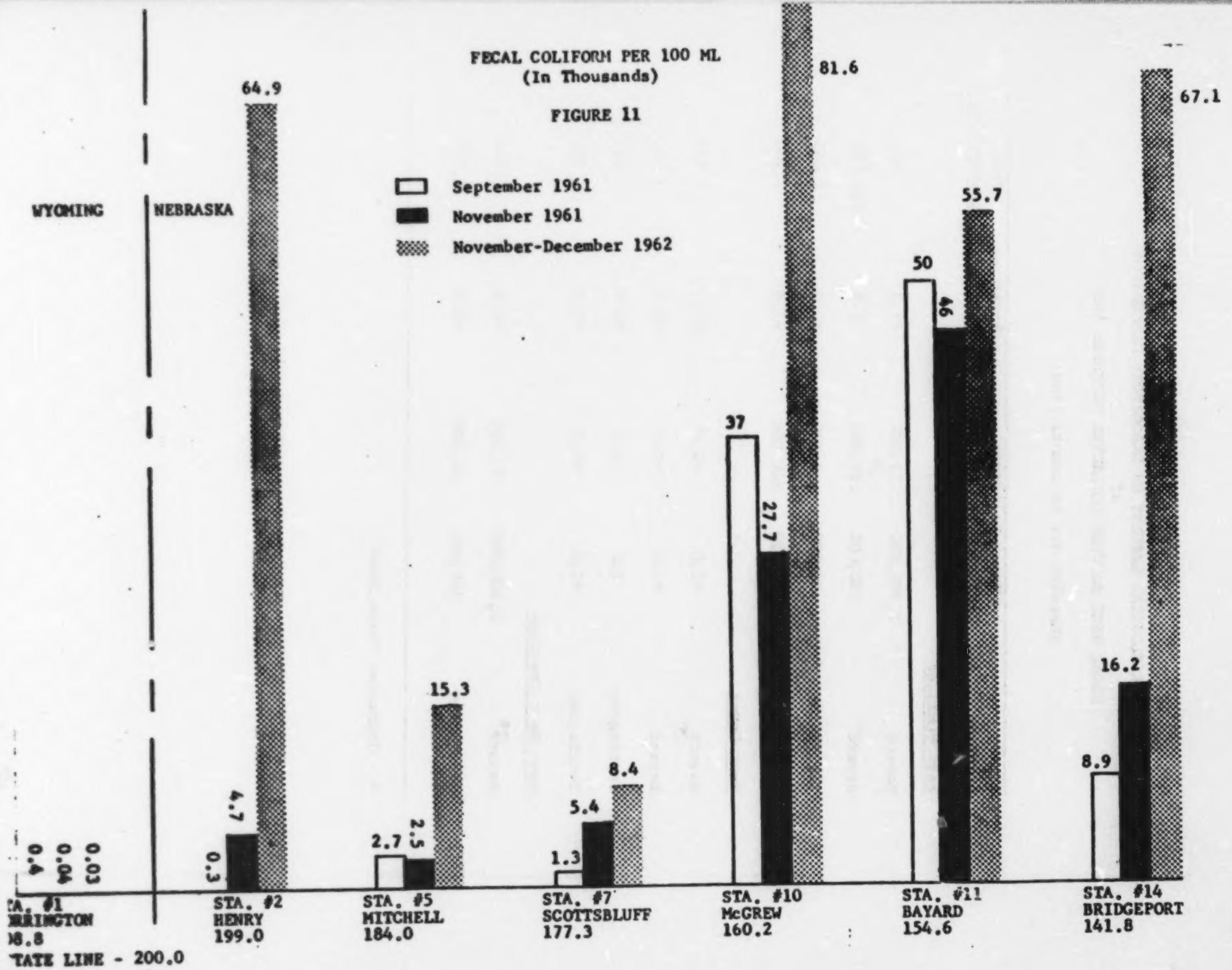
(Results are in counts/gram)

	Total Coliforms		Fecal	Fecal
Location	Confirmed	Completed	Coliform	Streptococci
Beet Peelings				
Bayard	2,780,000	11,000	*2.0	100
Bayard	330,000	230,000	2.0	230,000
Torrington	54,200	1,300	*2.0	1,000
Torrington	160,000	160,000	*2.0	900
Beet Cores				
Bayard	*2.0	*2.0	*2.0	*10
Bayard	*2.0	*2.0	*2.0	*10
Torrington	8.0	8.0	*2.0	*10
Torrington	*2.0	*2.0	*2.0	*10
Beet Root Crevices				
Bayard	2,300,000	17,700	*2.0	5,800
Torrington	160,000	54,200	*2.0	9,800

* - Indicates "less than"

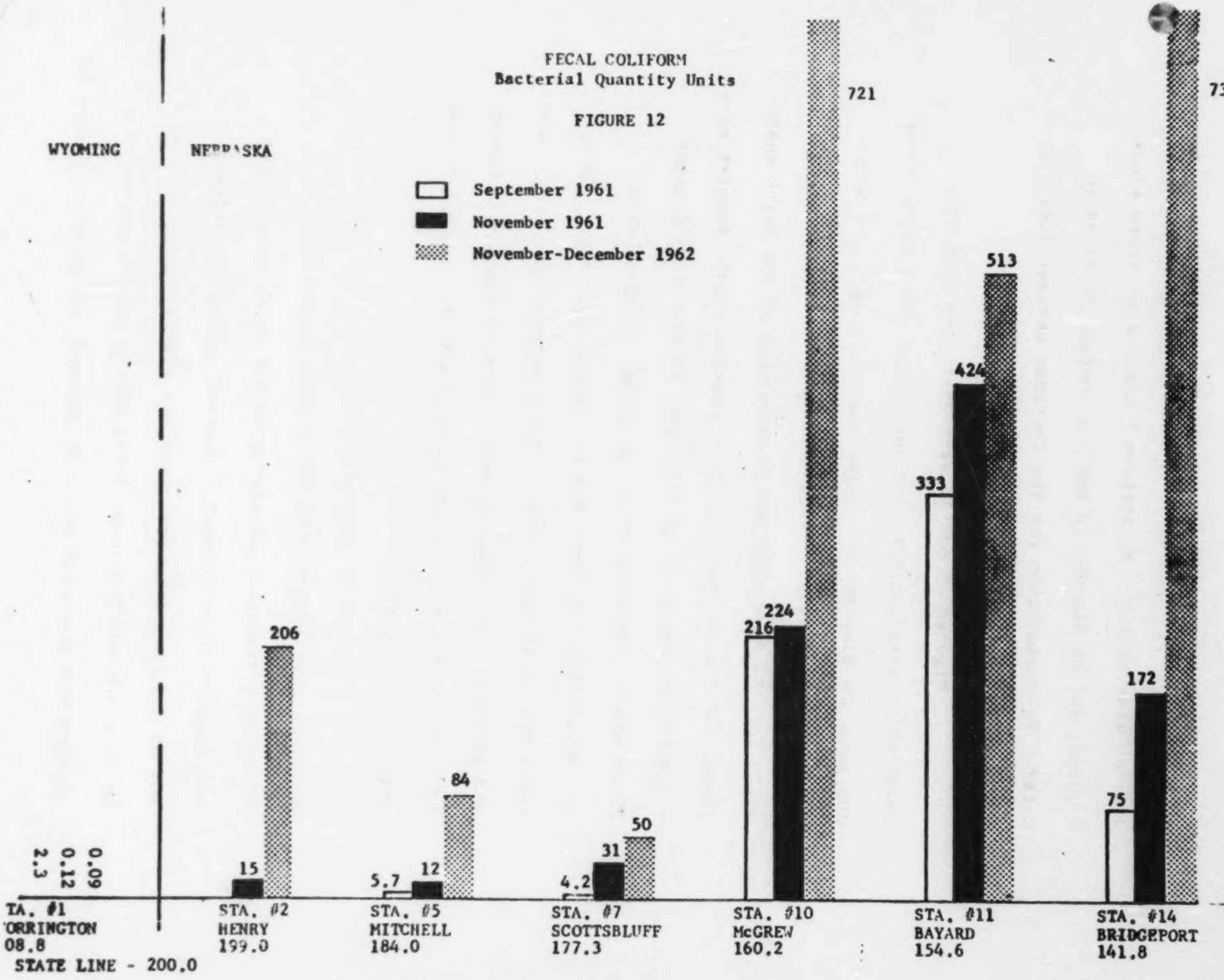
FECAL COLIFORM PER 100 ML
(In Thousands)

FIGURE 11



FECAL COLIFORM
Bacterial Quantity Units

FIGURE 12



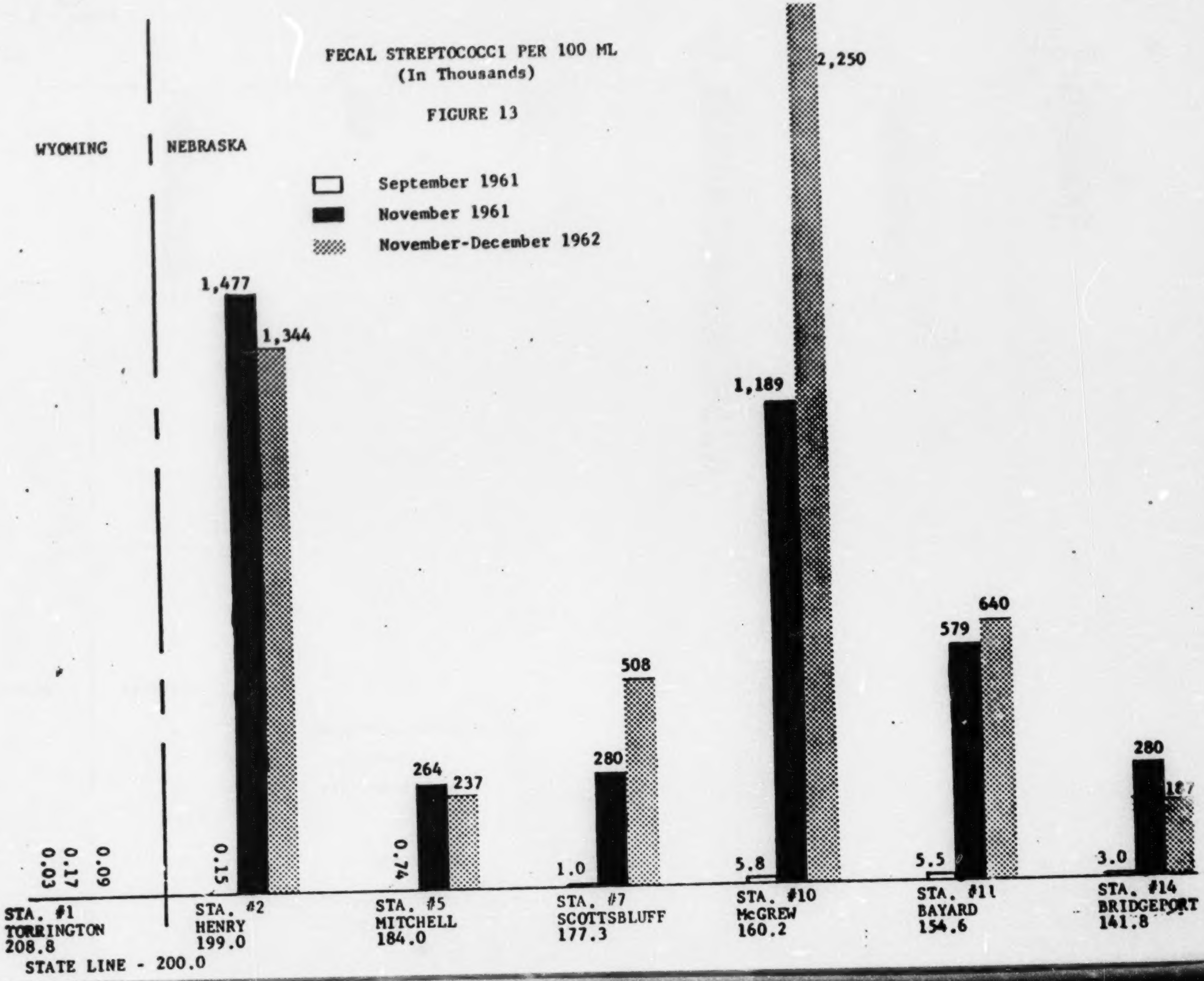
did not materialize. At Station 7 the number noted almost doubled, and at Station 10 again a twofold increase is noted. No explanation for the increase between Stations 7 and 10 is offered at this time

Figures 15 and 16 were developed from data obtained by sampling the five beet sugar plant waste lines, and show the biochemical oxygen demand in mg/l and pounds per day respectively. Composite samples were collected daily for the seven-day period from each of the plant waste lines. At the Scottsbluff Great Western plant, samples were collected at the point of discharge to the holding ponds. There was no discharge from the ponds. Samples were collected from the Great Western Bayard beet sugar plant waste system at two points -- the treatment device influent and effluent. All samples were composite samples composed of three portions collected at approximately two-hour intervals, beginning at 8:00 a.m.

Figure 15 indicates that pollution abatement measures initiated by the Holly Sugar Corporation have effected a reduction of approximately 63 percent of the BOD concentration in mg/l. However, since the volume of wastes discharged by the plant was significantly reduced by in-plant modifications, total BOD in pounds per day discharged was decreased about 82 percent, as shown in Figure 16.

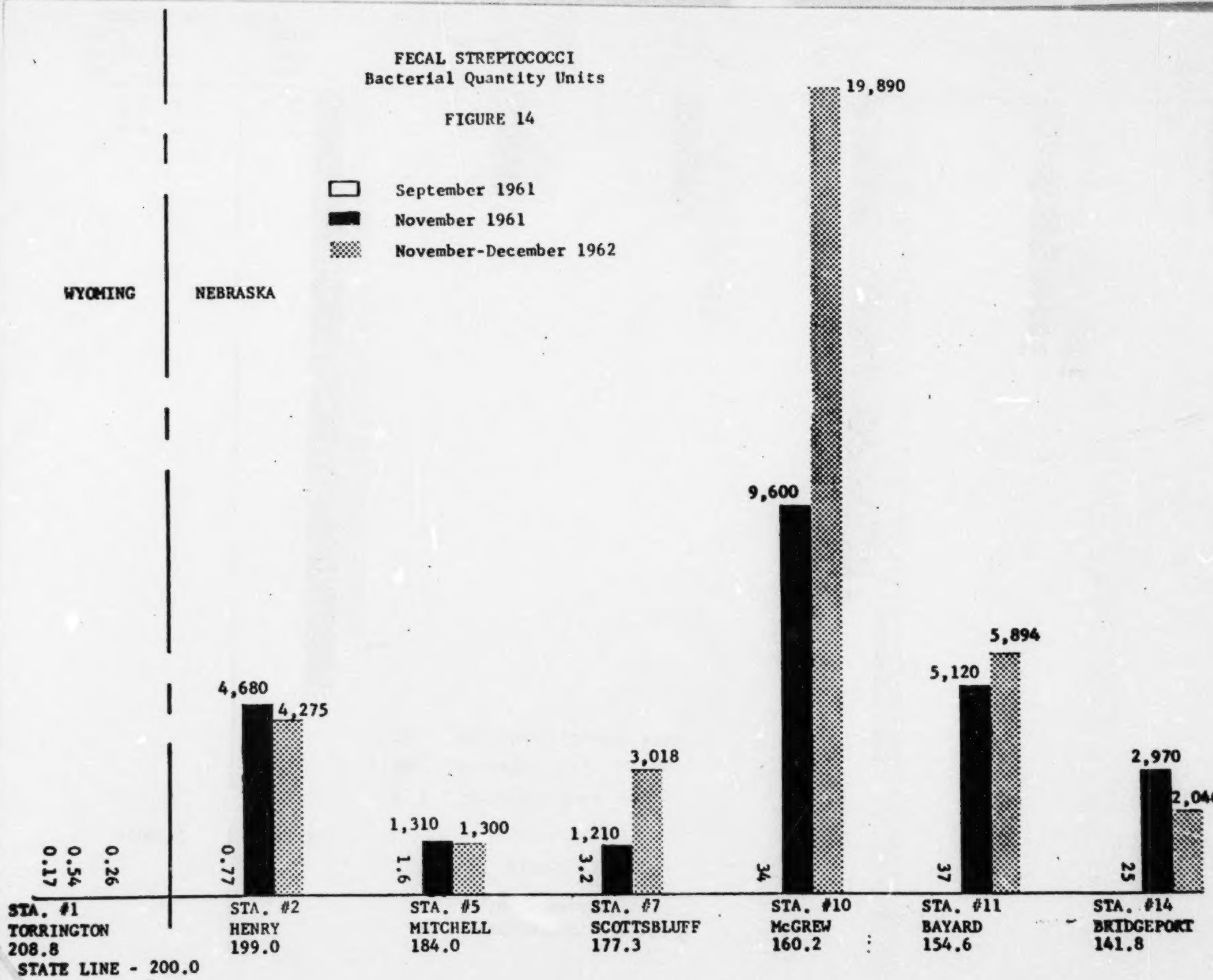
FECAL STREPTOCOCCI PER 100 ML
(In Thousands)

FIGURE 13



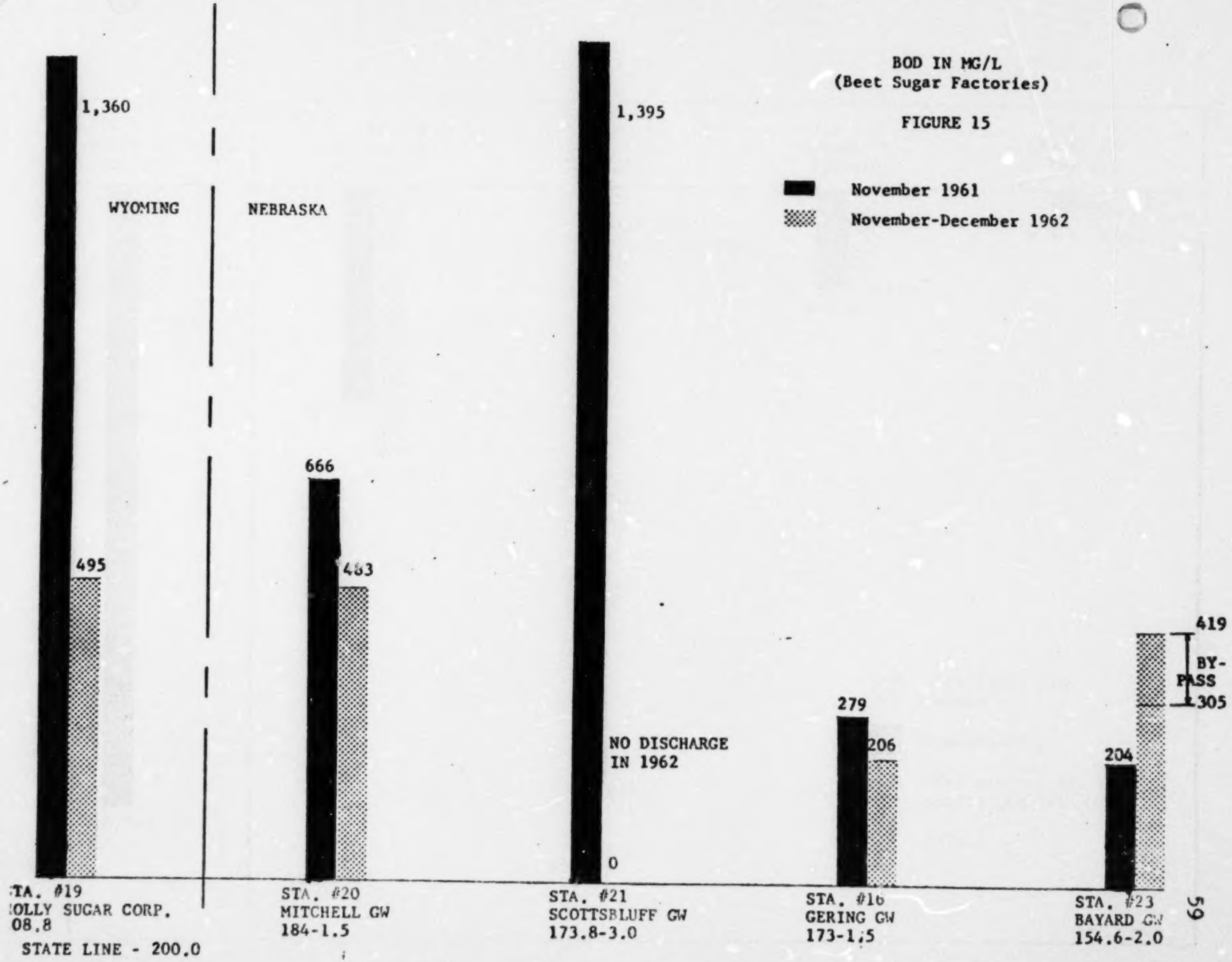
FECAL STREPTOCOCCI
Bacterial Quantity Units

FIGURE 14



BOD IN MG/L
(Beet Sugar Factories)

FIGURE 15



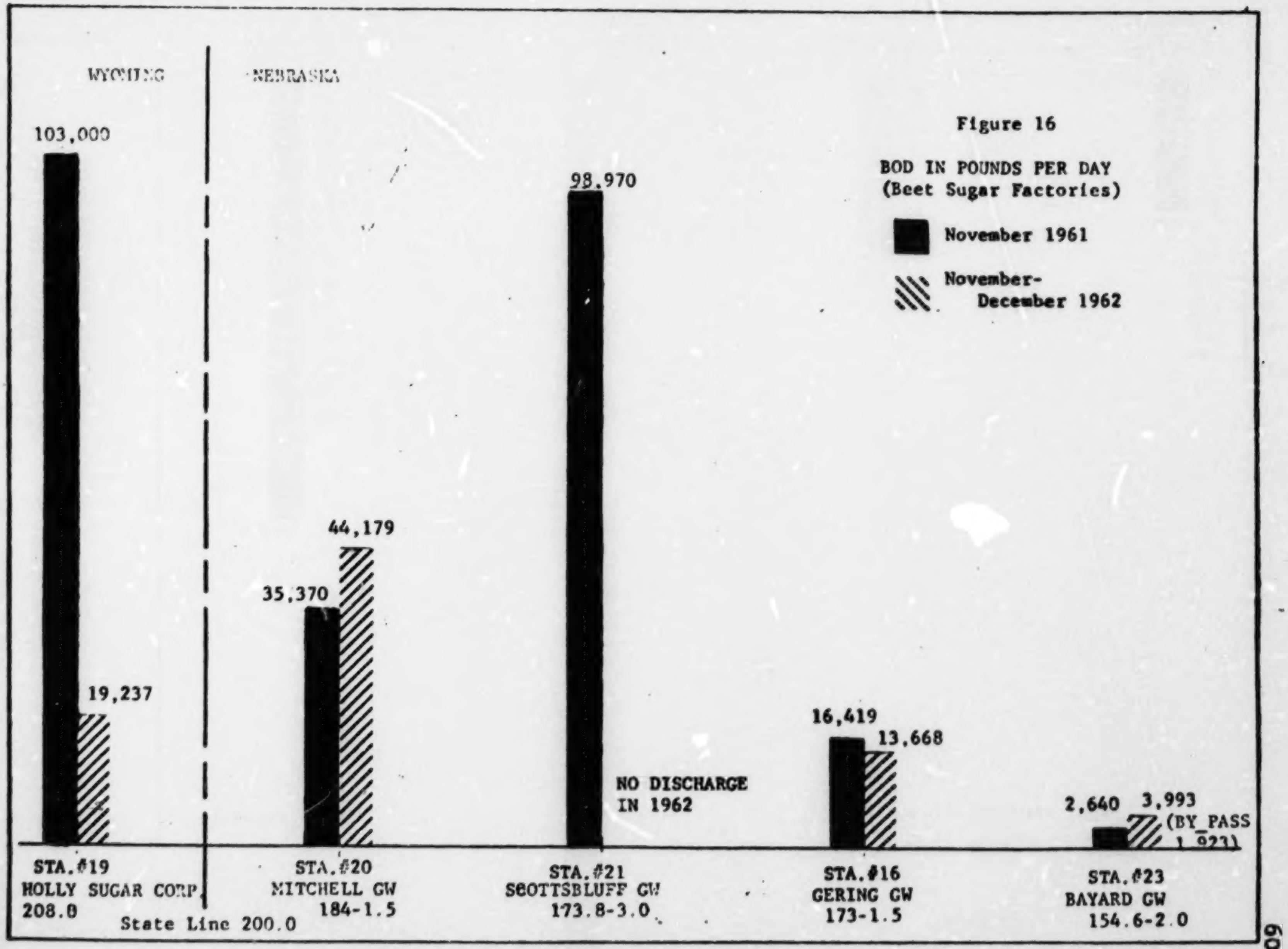


Figure 16

BOD IN POUNDS PER DAY
(Beet Sugar Factories)

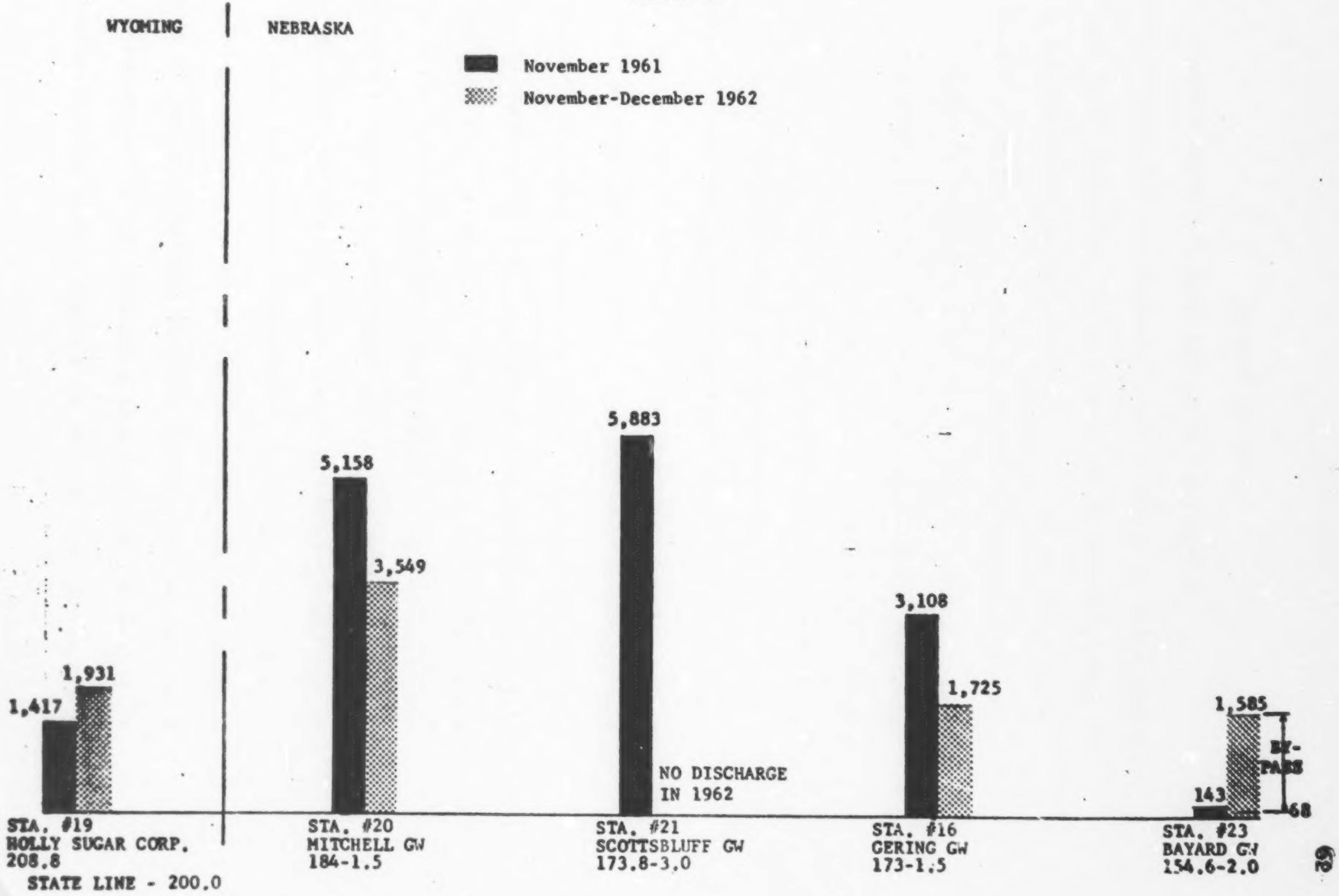
D. A. Townley

At Station 20, wastes from the Great Western sugar plant at Mitchell had a decrease in BOD concentration of approximately 28 percent, but the increased plant discharge resulted in an increase of BOD in pounds per day discharged to the stream of 25 percent. Discharge by the Great Western Scottsbluff plant was 0, a reduction of 98,970 pounds of BOD per day. The Great Western Gering plant showed a decrease in total pounds of BOD per day discharged to the river of approximately 16 percent.

The efficiency of the Great Western Bayard plant waste treatment facility was disappointing. The BOD of the waste discharged from the outlet of the holding pond increased from 204 mg/1 in 1961 to 305 mg/1 in 1962. However, total pounds of BOD discharged from the treatment device was reduced from 2,640 to 1,923, a decrease of approximately 27 percent. The lift station in this plant outfall line, which pumps waste from the outfall ditch to the treatment device, is equipped with a by-pass arrangement. As has been previously noted, this by-pass was very nearly in continuous operation. The amount discharged varied somewhat but was carefully estimated to be approximately 8 percent of the average plant discharge. As can be noted in Figure 16, this by-pass accounted for an estimated 2,070 pounds per day BOD discharged, which was approximatel

SUSPENDED SOLIDS IN MG/L
(Beet Sugar Factories)

FIGURE 17



50 percent of the total BOD discharged to the river by the Bayard plant.

Figures 17 and 18 show the suspended solids in mg/l and in pounds per day respectively from each of the five beet sugar plants. Total suspended solids discharged from the Holly Sugar Corporation were 75,042 per day, a decrease of approximately 30 percent. Total suspended solids discharged from the Great Western Mitchell plant increased from 273,800 pounds per day in 1961 to 324,621 in 1962, an increase of 18 percent. At Station 16, total suspended solids discharged by the Gering plant decreased from 183,530 pounds per day in 1961 to 114,455 in 1962, a decrease of 37 percent. The treatment device at the Bayard plant was apparently relatively efficient in removing suspended solids from the wastes, but the by-pass permitted large quantities to be discharged to the river, resulting in a total of 15,122 pounds per day of suspended solids in 1962.

The discharge of volatile suspended solids in mg/l and in pounds per day is shown in Figures 19 and 20. Total pounds discharged by the Holly Sugar Corporation decreased from 24,700 pounds per day in 1961 to 9,900 in 1962, a decrease of some 60 percent. The total pounds per day of volatile suspended solids discharged by the

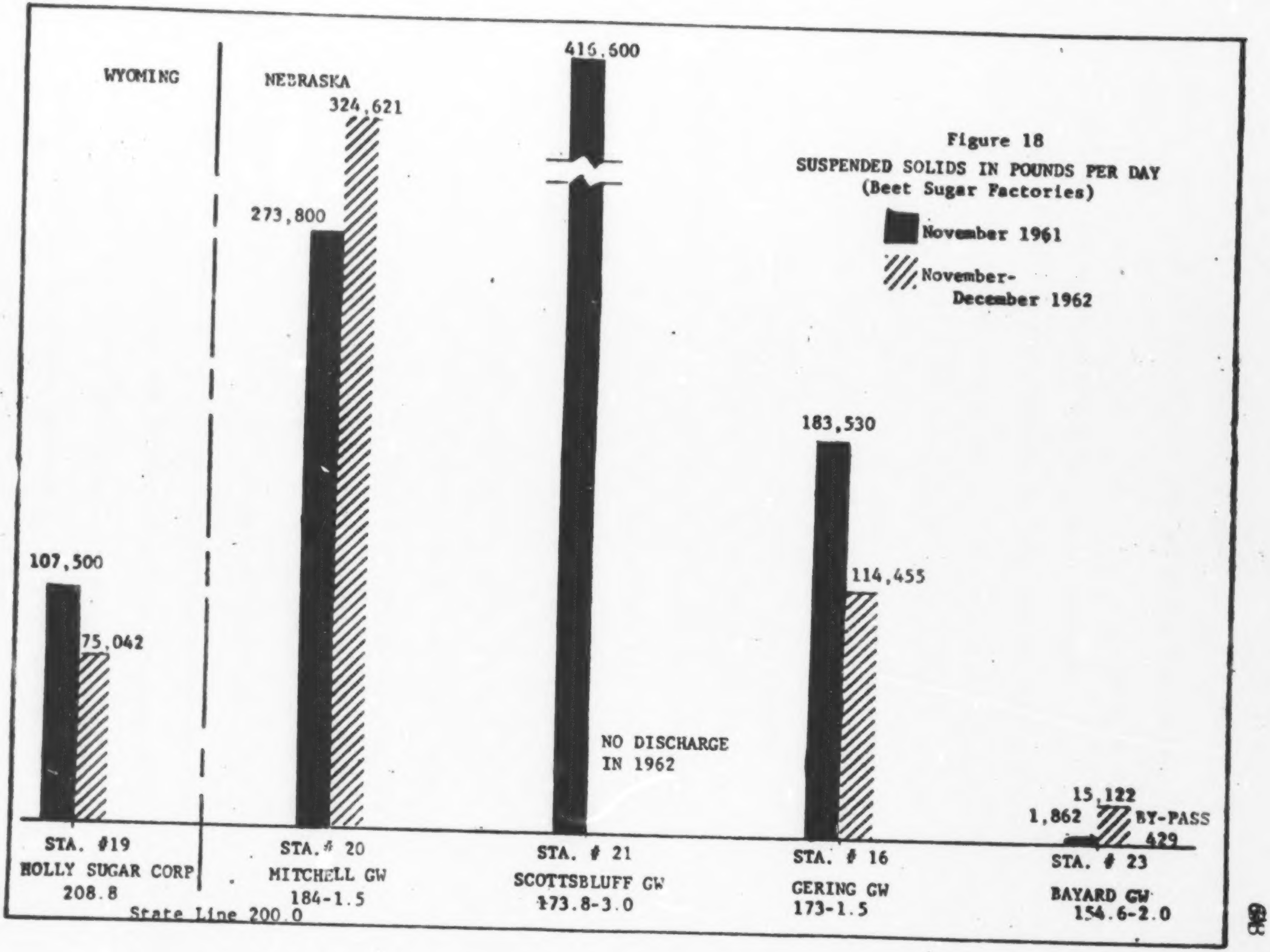
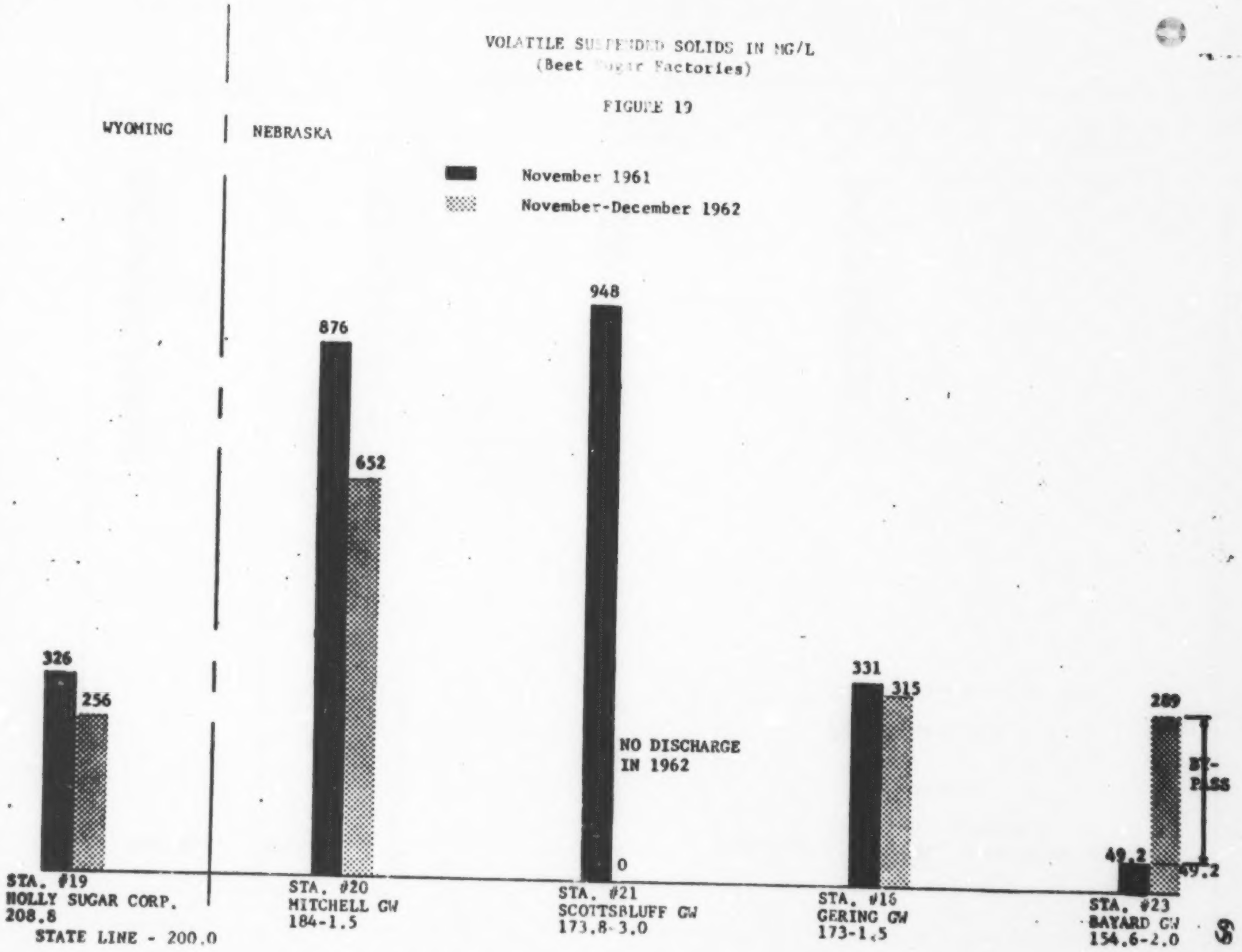


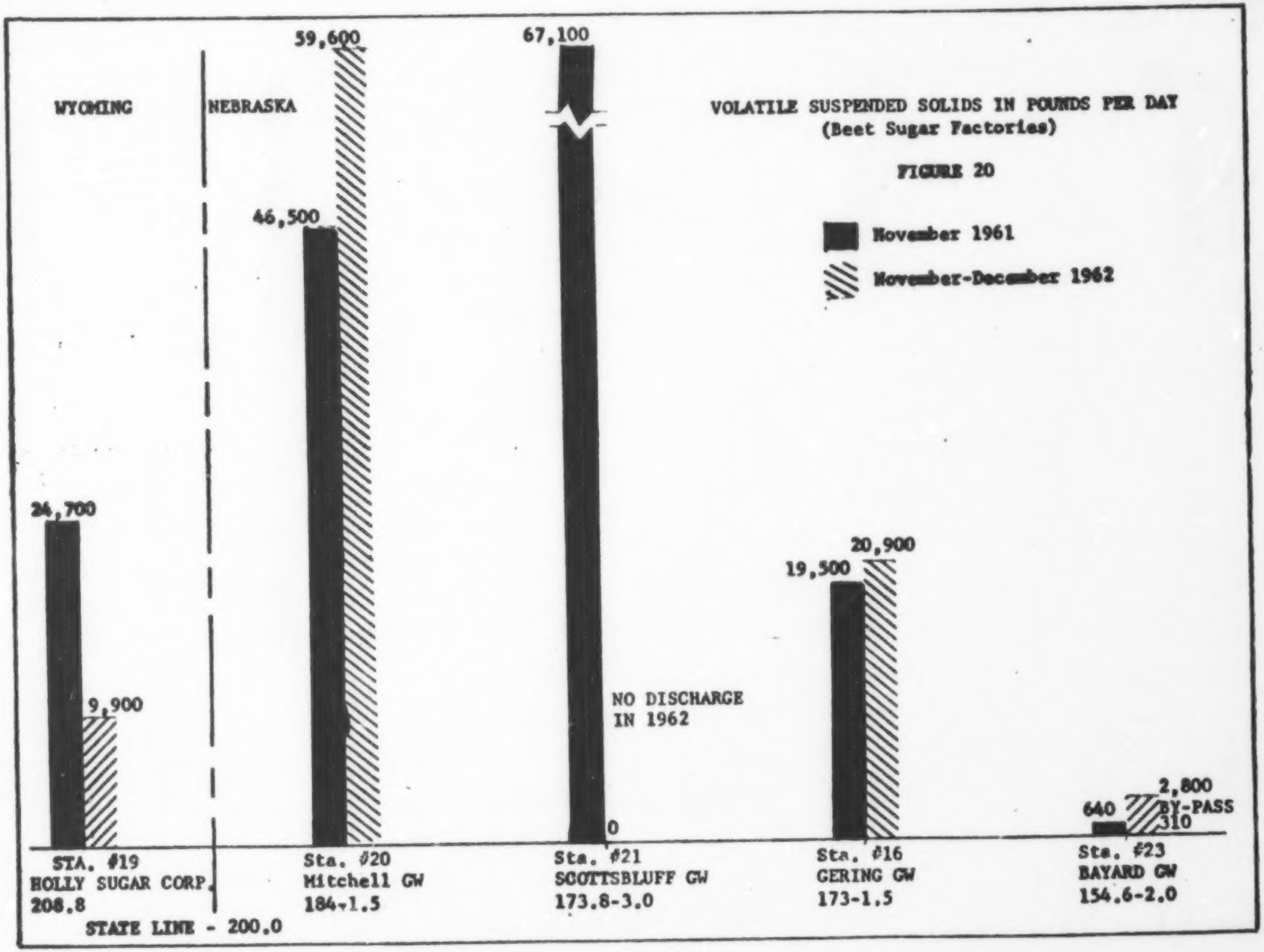
Figure 18

SUSPENDED SOLIDS IN POUNDS PER DAY
(Beet Sugar Factories)

VOLATILE SUSPENDED SOLIDS IN MG/L
(Beet Sugar Factories)

FIGURE 19





VOLATILE SUSPENDED SOLIDS IN POUNDS PER DAY
(Beet Sugar Factories)

FIGURE 20

Mitchell plant increased 28 percent, while the Gering plant remained approximately constant. Suspended solids discharged from the Bayard Great Western treatment device plus those contained in wastes by-passing the treatment device, were an estimated 2,800 pounds per day in 1962.

SUMMARY AND CONCLUSIONS

The survey conducted by the Public Health Service and the States of Wyoming and Nebraska was initiated in accordance with Recommendation No. 7 of the Conferees at the second session of the Conference on Pollution of Interstate Waters of the North Platte River, Wyoming-Nebraska. The survey was planned by representatives of the States and the Public Health Service. Analyses to be performed were agreed upon and sampling points were selected to depict any material changes from previous surveys in the quality of water of the North Platte River.

Industries and municipalities alike along this reach of the river, from Torrington, Wyoming, to Bridgeport, Nebraska, are exhibiting a very cooperative attitude toward providing adequate waste treatment facilities. The realization of the need for protecting this valuable water resource is apparent.

Prior to the beginning of the 1962 beet sugar campaign, the Holly Sugar Corporation completed the necessary in-plant modifications to remove all wastes from the river except flume water, and constructed holding ponds large enough to contain these wastes for the entire campaign. The capacity of screening equipment in the flume water waste line was materially increased to further reduce solids in waste discharged to the river. However, large quantities of wastes are still being discharged to the stream, as are heavy concentrations of bacteriological contamination.

It is reported that the Great Western Mitchell and Gering beet sugar plants have acquired sites for the construction of waste treatment facilities. The Scottsbluff plant has completed holding ponds to impound all wastes. The levees forming these ponds are of a temporary nature and several failures occurred during the 1962 campaign.

The Great Western Plant at Bayard remodeled its broad field irrigation system by constructing levees to form holding ponds. These levees were of a temporary nature and failed several times during the 1962 campaign. The lift station has not been modified to prevent significant quantities of waste from by-passing the treatment facility.

The municipality of Scottsbluff, Nebraska, has completed waste treatment facilities which will accommodate all industrial wastes in the city. The municipal treatment facility was placed in operation late in December of 1962. The progress of other municipalities, with the exception of Bayard, Nebraska, is very commendable. Specific information is shown in Table IV.

Unusually high concentrations of coliform bacteria were found at all river stations below Torrington, Wyoming. The average total coliform count at the Wyoming-Nebraska State Line (Station 2, Henry, Nebraska) was 112,000/100 ml (Figure 9), which is some 22 times the 5,000/100 ml recommended by the Engineering Section, Missouri Basin Health Council (Appendix B). The average fecal coliform count at the State line was 64,900/100 ml (Figure 11) and the average fecal streptococci at this station was 1,349,000/100 ml (Figure 13).

Wastes discharged to the river by the Holly Sugar Corporation continue to adversely affect the biota of the stream. However, conditions were considerably improved over the preceding year. The Holly Sugar Corporation waste load eliminated or markedly reduced the benthic population along the right bank of the river in reaches above river mile 199.5 as contrasted with significant reduction or eradication down to river mile 199 in 1961 (See Section II of this report).

Interstate pollution of the North Platte River is still occurring. While improvement is noted in the quality of water throughout the reach of the stream under consideration, it is evident that large quantities of waste and very high bacterial concentrations are still being discharged to the stream above the State line. Additional treatment of the Holly Sugar Corporation wastes will be required to eliminate interstate pollution and to restore the Wyoming reach of the North Platte River to the degree of water quality commensurate with water uses in that section of the stream. Proposed Nebraska improvements, when completed and properly operated, will eliminate pollution now evident below the State line, and restore the quality of the river to a point which is compatible with that which will be entering Nebraska from Wyoming.

RECOMMENDATION

That a survey be conducted during the 1963 beet sugar campaign with particular emphasis on determining the origin of the high bacterial concentration present in the interstate reach of the North Platte River during the beet sugar campaign.

(The charts and tables submitted with Section I are as follows:)

D. A. Townley

SECTION II

Biological

Biological Effects of Wastes Discharged to the North Platte River, Torrington, Wyoming - Bridgeport, Nebraska, November 14 and 15, 1962

Joe K. Neel

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Collections and observations in 1962 were made at most localities selected in 1960 and 1961 (Table 1). Access to desired sampling areas was denied by deep water in alongshore channels at Station 9 and the drop in water level exposed all benthic habitat areas at Station 5. The area below the bridge at BcGrew was substituted for Station 9.

General Appearance

Clear water passing under the Torrington, Wyoming, bridge (Station 1) was still discolored along the right bank by turbid wastes leaving the beet plant outfall. These discharges lacked the foam and beet particles that were salient items during the 1960 and 1961 beet campaigns. The right half of the river alone remained muddied downstream past Station 2-R, but wastes spread to encompass the entire river width shortly above Station 3. Stations 3, 4, 5 and 6 were noticeably less turbid than during November 1960 or 1961. Turbidity increased at Station 7 and again at Station 8, and remained near the latter level past Station 10 (Bridgeport). Concentration at all stations was obviously below 1961 levels. Accumulations of beet debris were nowhere noticeable, but cossettes and pulp fibers were recovered, at all stations sampled, except 1 and 2L, from masses of flotsam and jetsam caught on driftwood, fences, bridge piers, etc.

Waste solids settled on the bottom in appreciable quantities along the right half of the river from the Holly Sugar Corporation beet plant outfall to some distance below Station 2-R. At 2-R, the bottom was covered with sludge and silt from the right shore to past midstream. The thin gray upper layer of this deposit covered a black stratum two to four inches thick. At Station 3, the upstream face of the dam bore blankets of sludge, but bottom in all other areas at that locality was sand or sand and rocks. Sand was the only bottom material observed at Stations 4 and 5, but silt and sludge accumulations were noted atop and along the right bank at Stations 6 and 7. Bottom could not be observed at Station 8. Sand was the only component noted at McGrew and Station 10. Driftwood, pieces of fence, weeds and other materials anchored in the sand, and debris caught on such obstructions, were the principal habitats of algae and bottom animals below Station 2-L.

Algae and Slime Growths

Sphaerotilus formed a pinkish waving blanket over large areas of the sludge deposited along the right half of the stream bed at Station 2-R. It occurred in scattered patches at Station 3 and in sparse amounts intermixed with benthic algae at Stations 3 and 4. It was not recovered below Station 4. (Table 2).

Composition of benthic algal growths sampled at each station also appears in Table 2. The most abundant widespread species, Diatoma vulgare, invested other algae, weeds and grasses, and various other submerged substrates. Cladophora formed rather luxuriant growths at Stations 1, 2-L, 10 and at McGrew. Red algae (Compsopogon) occurred as widely scattered small saccate growths that bore very few short filaments. Diatoms other than Diatoma vulgare, Cocconeis, Synedra amphicephale (which were attached to other algae, grasses, weeds, etc.) were components of brown gelatinous layers on sand, driftwood and stones. Chroococcus, Merismopedia, and Euglena occurred in the interstices of green algae and filamentous diatoms. Phormidium formed small scattered dark blue-green patches.

At Station 1, green algae (Cladophora and Oedogonium) were largely concentrated on the riffle near the right bank below the coffer dam and caught on driftwood along the lip of the dam. Floating fronds frequently drifted over the sandy area above the dam. Brown diatom layers covered large areas of sand and gravel bottoms under the bridge and floating patches of such growths dislodged from upstream sites were common. Diatoma was attached to other algae and smaller pieces of driftwood. At Station 2-L, the gravel and sandy bottom was largely covered with green algae that were very densely invested with Diatoma, Synedra, and Cocconeis. A few scattered areas bore brown plate-like layers of other diatoms. At Station 2-R, the Sphaerotilus carpet contained a few scattered blue-green tufts of Phormidium. Bottom at Station 3 bore widely dispersed clumps of Sphaerotilus. Algae grew there on sand, on sticks and other detritus caught in sand, on rocks near the dam, and on the walls of the control channel and ditch control gate. Patches of diatom jellies were common on stable sand along the left shore. At Station 4, the most conspicuous algal growths were attached to driftwood, but some diatom films were seen on the sandy bottom near the right bank. Algae were rather scarce at Station 6. Some diatom films occurred at the bottom in shallow areas, and Diatoma and other diatoms invested some sticks and grasses. Green algae (Cladophora) formed very minute portions of attached growths. Coontail (an aquatic flowering plant) was recovered from debris accumulations.

At Station 7, green algae were somewhat more numerous than at Station 6. Diatoma and its associates occurred with the green algae and other diatoms formed brown gelatinous films on stable bottom areas and logs and planks comprising a driftwood accumulation at the bridge. At Station 8, algae (green algae and diatoms) occurred only on driftwood and other detritus. None were attached to bottom or bridge piers and the suspicion arises that algae noted on obstructions there had not developed on such sites but had recently been stranded as they floated downstream. Pieces of coontail were also present in accumulated debris. At McGrew the bottom had been disturbed to a considerable extent by dredging and filling concomitant to construction of a new bridge, but numerous waving algal fronds were attached to detritus caught on various anchored pieces of wood, weeds, wires, etc. At Station 10, algae grew on sticks, boards, and debris caught on obstructions beneath the bridge, and on submerged grasses along the shore. Diatoma was especially conspicuous on the grasses.

In November 1960, algae disappeared at Station 3 and were absent from there down to Mitchell, where collections stopped. In October and November, 1961, benthic algae were found at Stations 1, 2-L, 4, 6, 7 and 9. Sphaerotilus occurred at all stations except 1 in 1961 and was the only growth present at 2-R, 3 and 8. Turbidity appeared lower in the fall of 1961 than during the 1960 beet campaign.

Benthic Animals

At Station 1, habitat for this group consisted of various sized stones, driftwood tangles, and debris caught on various obstructions. At 2-L, they lived among gravel and small stones and on driftwood and its accumulated debris. At all other stations organisms were found only on driftwood and debris accumulations.

Distribution of various bottom dwelling animals found in November 1962 is shown in Table 3. The maximum number of species (20) occurred at Station 1. No organisms were found at 2-R, but decimation in number of forms was otherwise not very marked until Station 6, where only seven occurred. Caddisflies (Trichoptera) and stoneflies (Plecoptera) appeared least tolerant of the waste components discharged at Torrington and below. Appearance of the stonefly (Allocapnia) at Station 10 could possibly be interpreted to indicate some degree of recovery, although the number of species had not increased over that noted at McGrew and Station 8. Pollutional effects were seemingly most pronounced at Station 7, where only four different organisms occurred.

In the fall of 1960, benthic animals were eliminated from the right half of the stream bed from the Torrington outfall down to Station 3, and from the entire stream bed from Stations 3 and 6. In 1961, beet wastes eradicated this class of organisms at Station 2-R, 4 and 8 before November 1 (the beet campaign began around October 1) and numbers of organisms were severely reduced at most other stations before October 31. The following table indicates the number of survivors at each station each year.

D. A. Townley

Station	No.	Forms
	1961 (Oct. 31-Nov. 2)	1962 (Nov. 14-15)
1	23	20
2-L	17	18
2-R	0	0
3	4	15
4	0	15
6	7	7
7	4	4
8	0	7
McGrew	-	7
9	1	-
10	6	7

Conditions were considerably improved from the benthos viewpoint in 1962. The Holly Sugar Corporation waste load eliminated or markedly reduced the population along the right bank only in reaches above Station 3 as contrasted with significant reduction or eradication down to Station 4 in 1961. Wastes discharged from the Mitchell beet plant had adverse effects at the West Scottsbluff bridge (Station 7) each year, but reductions in the waste load from the Scottsbluff beet plant in 1962 were seemingly responsible for survival at Station 8 of a number of forms that perished there during the 1961 beet campaign. It is assumed that survival in reaches between Stations 8 and 10 was also enhanced by wastes reduction effected at Scottsbluff. Discharge from the treatment area at the Bayard beet plant was clear and apparently lacked sphaerotilogenic materials on November 15, 1962.

Greater survival of benthic algae and animals and decreased production of Sphaerotilus in 1962 appeared to be directly related to decreased waste loads leaving the Torrington and Scottsbluff beet factories. Conditions in the river reach below the Mitchell beet plant allowed about the same degree of organisms survival as was noted in 1961, and it would appear that no improvement in waste removal was realized at that plant. Biological resources of the river still suffered deleterious effects traceable to beet plant discharges. Conditions were much improved at the Wyoming-Nebraska boundary; and the most undesirable conditions were promoted by discharges from beet plants located in Nebraska.

(The charts and tables submitted with Section II are as follows:)

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NORTH PLATTE RIVER

Table 1 Biological Sampling Sites 1962

STATION	LOCATION	RIVER MILE ABOVE MOUTH
1	Torrington, Wyoming	208.5
2-L	Left side of River 1 mile below Station 1	207.5
2-R	Right side of River, at above point	207.5
3	Gering-Mitchell Diversion Dam - Wyoming	199.5
4	Henry, Nebraska	199
6	Mitchell, Nebraska	184.7
7	West Scottsbluff, Nebraska Bridge	178
8	Minatare-Melbeta Bridge	165.5
-	McGrew, Nebraska	160.2
10	Bridgeport, Nebraska	141.5

Station 9, Bayard, Nebraska, mile 154.6, not used.

Table 2

Benthic Algae - North Platte River - November 14-15, 1962

Station number	1	2L	2R	3	4	6	7	8	McGrew	10
Green Algae										
Cladophora sp.	+	+		+	+	+	+	+	+	+
Closterium sp.	+			+		+				
Cosmarium sp.	+									
Microspora sp.	+	+		+						
Oedogonium	+									
Pediastrum integrum		+		+						
Scenedesmus armatus		+								
Spirogyra				+					+	
Diatoms										
Amphora sp.	+									
Cocconeis pediculus	+	+		+			+	+	+	
Cymatopleura solea	+			+	+					
Cymbella aspera	+	+		+		+	+			
Cymbella sp.	+	+		+	+	+	+		+	
Diatoma vulgare	+	+		+	+	+	+	+	+	+
Gomphonema sp.		+		+			+		+	
Gyrosigma										+
Mastogloia smithii	+	+		+	+	+	+		+	+
Melosira granulata		+		+		+		+		
Navicula cuspidata	+			+		+		+	+	
Nitzschia elongata	+	+		+	+	+	+	+	+	+
Nitzschia sigmoidea	+			+			+			
Pleurosigma delicatulum	+	+		+		+	+			
Stauroneis sp.							+			
Stephanodiscus astraea	+									
Surirella sp.				+	+	+			+	+
Synedra amphicephala		+		+		+	+			
Blue-green Algae										
Chroococcus sp.	+									
Phormidium sp.	+	+	+	+					+	
Merismopedia elegans	+	+								
Euglenophyta										
Euglena sp.		+		+						
Red Algae										
Compsopogon sp.	+	+				+	+			
Sphaerotilus			+	+	+					

Table 3 Individual Benthos Analyses on North Platte River - November 1962

Station Number	1	2	3	4	6	7	8	9	10
PLATYHELMINTHES									
Dugesia sp.	x			x					
ANNELIDA									
Tubificidae							x		
Placobdella ornata (Verrill)				x					
MOLLUSCA									
Gastropoda									
Physa sp.			x	x		x			
CRUSTACEA									
Amphipoda									
Hyalella azteca				x	x	x	x		x
Isopoda									
Asellus militaris							x	x	x
INSECTA									
Plecoptera									
Allocapnia mystica Frison									x
Isoperla sp.	x	x	x						
Ephemeroptera									
Centroptilium sp.		x							
Ephemerella excrucians	x	x	x	x				x	
Heptagenia diabasia	x	x	x	x	x	x	x	x	x
Heptagenia flavescens	x								
Heptagenia marginalis		x	x	x					
Heterocloen sp.		x	x	x	x		x	x	x
Leptophlebia sp.	x		x	x					
Tricorythodes sp.		x	x		x				
Odonata									
Argia sp.	x								
Hetaerina sp.	x		x						
Ophiogomphus sp.	x	x							
Hemiptera									
Ambrysus mormon montadon	x	x	x						
Lethocerus americanus									x
Trichoptera									
Hydropsyche sp. 1	x	x	x	x					
Hydropsyche sp. 2	x								
Coleptera									

Table 3 Individual Benthos Analyses on North Platte River - November 1962

Station Number	1	2	3	4	6	7	8	9	10
Gyrinus sp.	x								
Diptera									
Calopsectra sp.	x	x		x					
Chironomus militaris Joh.					x				
Cricotopus exilis Joh.								x	
Cricotopus (Group C - Edwards)				x					
Diamesia nivoriunda				x					
Diamesia sp.		x	x						
Glyptotendipes senilis		x				x			
Pentaneura flavifrons gr.		x							
Similium sp.	x	x	x	x	x		x	x	x
Spaniotoma (O.) obrumbrata Joh.	x	x	x	x					
Spaniotoma (O.) nivoriunda	x	x	x		x		x	x	
Spaniotoma sp.	x								
Tipula sp.	x								
NEMATODA SP.	x	x							

APPENDIX A

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 1 (RP208.8)

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal. Phenol mg/l (as $CaCO_3$)	Alkal. Total mg/l (as $CaCO_3$)	Cl− mg/l	Hard. mg/l	Ca mg/l	Mg. mg/l	Spec. Conduct µmhos/cm.	True Color Units	Turb Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N. Per 100 ml.	Fecal Strep Per 100 ml.
9	22	08 00A	10	8.58	1.22	25.0	6.0	8.0	0	184	17.1	306	200	106	666	8	*25			50
9	23	11 15A	12	9.23	1.16	18.0	15.0	8.3	0	187	17.3	310	203	107	657	8	*25	3,300	2,300	38
9	24	07 50A	10	8.71	0.96	22.0	4.0	8.1	0	182	16.9	302	200	102	690	8	*25	1,300	*200	75
9	25	10 00A	12	9.30	1.29	15.5	5.5	8.1	0	195	16.1	298	203	95	705	5	*25	50	20	17
9	26	11 45A	14	9.10	2.67	14.5	9.5	8.2	0	196	14.2	298	215	83	725	5	*25	40	*20	4
9	27	11 25A	15	9.34	1.83	17.0	11.0	8.2	0	206	16.3	300	204	96	720	8	*25	130	20	22
9	28	08 30A	10	8.98	1.30	11.5	0.0	8.1	0	197	16.4	301	204	97	720	8	*25	80	70	19
AV			12	9.03	1.50	17.6	7.3	8.1	0	192	16.2	302	204	98	697	7	*25	800	*430	32
11	07	07 40A	04	10.23	0.95	19.6	9.6	8.1	0			306			690	7	*25	80	50	70
11	08	11 03A	06	11.10	1.00	5.6		8.2	0			299			725	8	*25	70	20	50
11	09	06 50A	04	9.78	1.41	21.2	1.6	8.1	0	176		306			705	7	*25	110	50	43
11	10	10 30A	07	10.54	0.80	6.0	2.0	8.3	0	174		298			741	4	*25	*20	*20	40
11	11	06 35A	05	9.39	1.07	4.4	4.0	8.1	0	175		304			700	7	*25	20	*20	100
11	12	10 00A	06	10.71	1.12	10.0	4.8	8.2	0	176		302			666	7	*25	50	50	30
11	13	07 00A	04	10.18	1.00	8.8	0.4	8.1	0	176		300			770	7	*25	70	20	400
11	14	10 25A	04	11.21	0.83	3.2	2.8	8.1	0	174		300			752	7	*25	70	*20	44
11	15	07 05A	04	10.00	0.50	5.7	4.0	8.0	0	176		297			705	7	*25	80	50	124
11	16	03 35P	05	12.00	1.51	4.4	4.4	8.2	0	170		292			690	7	*25	*20	*20	26
11	17	12 50P	04	11.57	0.91	6.5	6.5	8.0	0	174		297			668	7	*25	50	*20	1,200
11	18	09 30A	04	10.89	1.11	9.7	6.3	8.1	0	174		300			690	7	*25	80	*20	150
11	19	03 15A	03	10.10	1.00	9.0	9.0	8.1	0	173		297			741	3	*25	50	50	102
11	20	05 10A	01	10.58	0.95	10.7	10.7	8.1	0	174		299			683	7	*25	110	20	140
AV			4	10.6	1.0	8.9	5.1	8.2	0	174		300			710	7	*25	70	39	170

NOVEMBER - DECEMBER 1962

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal. Phenol mg/l (as $CaCO_3$)	Alkal. Total mg/l (as $CaCO_3$)	Cl− mg/l	Hard. mg/l	Ca mg/l	Mg. mg/l	Spec. Conduct µmhos/cm.	True Color Units	Turb Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N. Per 100 ml.	Fecal Strep Per 100 ml.
11	30	08 30A		9.57	3.0	8	2											50	20	106
12	1	08 15A		9.10	2.2	46	8											*20	*20	74
12	2	08 30A		10.31	1.4	95	14											20	*20	42
12	3	08 15A		9.70	2.4	10	2											50	50	64
12	4	08 25A		10.40	1.4	6	4											-	-	-
12	5	08 20A		11.02	1.2	6	3											170	70	68
12	6	07 10A		10.40	3.0	4	4											20	*20	206
AV				10.1	2.09	25	5.29											55	33.3	93.3

* INDICATES LESS THAN

A-2

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES

STATION 2 (NP199.0)

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D mg/l	Susp. Solids mg./l	Volatile Susp Solids mg./l	pH	Alkal Phenol mg/l (as CaCO$_3$)	Alkal. Total mg/l (as CaCO$_3$)	Cl$^-$ mg/l	Hard. mg/l	Ca. mg/l	Mg. mg/l	Spect. Conduct µmhos/cm.	True Color Units	Turb. Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N Per 100 ml	Fecal Strep. Per 100 ml.
9	22	08 30A	10	8.95	1.41	27.0	4.0	8.0	0	196	18.4	298	196	102	700	9	30			470
9	23	10 35A	11	9.41	1.09	30.0	16.0	8.2	0	198	18.0	305	188	117	680	9	25	1.400	200	120
9	24	08 20A	10	8.99	1.24	25.0	4.0	8.2	0	194	17.7	302	188	114	715	10	30	10.900	1.400	290
9	25	10 25A	11	9.69	2.11	17.5	6.5	8.1	0	206	17.5	299	203	96	752	6	*25	1.300	*200	46
9	26	12 10P	14	9.60	2.39	19.5	10.5	8.2	0	214	19.8	302	198	104	764	8	*25	330	80	20
9	27	11 55A	14	9.81	1.54	29.0	22.0	8.3	0	213	17.1	304	197	107	752	7	*25	230	80	8
9	28	08 50A	10	9.34	1.25	10.0	5.5	8.3	0	213	17.3	301	156	145	770	9	*25	1.720	130	76
AV			11	9.39	1.6	22.6	9.7	8.1	0	204	17.9	301	186	112	733	8	*26	2.600	*348	146
11	07	08 20A	4	8.38	52.4	56.	22.	7.9	0			300			740	16	40	130.000	11.000	1.700.000
11	08	10 32A	6	8.50	41.1	63.	25.	8.0	0			304			834	13	35	221.000	3.300	390.000
11	09	07 20A	4	7.75	44.5	96.	31.	7.9	0	197		302			775	13	40	240.000	7.000	3.300.000
11	10	09 00A	6	7.60	47.1	43.	5.	8.0	0	196		299			832	13	40	172.000	2.000	1.500.000
11	11	07 05A	6	6.42	52.9	55.	28.	7.9	0	197		300			769	14	55	278.000	2.000	2.300.000
11	12	09 35A	6	7.89	49.7	60.	24.	8.0	0	196		302			769	16	45	141.000	8.000	3.400.000
11	13	07 30A	4	8.21	44.6	61.	21.	8.0	0	197		293			848	14	50	79.000	2.000	400.000
11	14	09 35A	4	8.51	44.7	71.	27.	7.8	0	196		300			763	13	65	175.000	2.000	940.000
11	15	07 35A	4	7.90	55.4	59.	27.	7.9	0	196		295			807	13	45	130.000	*2.000	680.000
11	16	3 00P	4	8.90	61.2	76.	37.	8.0	0	200		296			790	13	55	33.000	*2.000	260.000
11	17	01 20P	4	8.64	61.8	49.	28.	7.8	0	199		301			770	13	45	172.000	8.000	340.000
11	18	09 00A	3	8.54	46.8	90.	37.	7.8	0	198		300			690	14	40	490.000	*2.000	1.250.000
11	19	03 40A	3	8.01	46.6	85.	54.	7.8	0	199		294			840	14	50	49.000	2.000	8.000
11	20	04 40A	1	8.41	75.4	74.	44.	8.0	0	194		297			683	14	55	330.000	*2.000	3.500.000
AV			4	8.1	48.4	67.0	29.2	7.9	0	197		298			779	14	47	88.571	4.730	1.477.142

NOVEMBER - DECEMBER 1962

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D mg/l	Susp. Solids mg./l	Volatile Susp Solids mg./l	pH	Alkal Phenol mg/l (as CaCO$_3$)	Alkal. Total mg/l (as CaCO$_3$)	Cl$^-$ mg/l	Hard. mg/l	Ca. mg/l	Mg. mg/l	Spect. Conduct µmhos/cm.	True Color Units	Turb. Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N Per 100 ml	Fecal Strep. Per 100 ml.
11	30	09 00A		9.24	56.4	42	11											23,000	5,000	960,000
12	1	08 45A		9.85	42.4	57	15											79,000	49,000	4,200,000
12	2	09 00A		10.02	10.0	51	18											79,000	33,000	1,130,000
12	3	09 00A		9.30	13.0	35	10											109,000	49,000	520,000
12	4	08 55A		10.24	18.5	33	15											79,000	79,000	830,000
12	5	08 55A		10.98	17.1	34	9											172,000	109,000	820,000
12	6	07 30A		10.08	15.4	38	12											240,000	130,000	950,000
AV				9.96	24.69	41.4	12.9											111,571	64,857	1,344,286

* INDICATES LESS THAN

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES

STATION 5 (NP184)

Month	Date	Sample Time	Temp °C	D O mg/l	B O D mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l (as CaCO3)	Alkal Total mg/l (as CaCO3)	Cl - mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spect. Conduct µmhos/cm	True Color Units	Turb Units	Coli MPN Per 100 ml	Fecal Coli MPN Per 100 ml	Fecal Strep Per 100 ml
9	22	10 00A	10	8.87	1.67	55.0	14.0	8.1	0	307	22.1	258	158	100	869	12	60			1.360
9	23	09 15A	11	9.37	1.18	19.0	11.0	8.1	0	310	21.7	267	118	149	840	14	25	17.200	4.900	900
9	24	09 25A	10	8.52	1.25	26.0	7.0	8.0	0	292	19.6	280	155	125	847	8	25	13.000	7.900	570
9	25	11 40A	14	10.23	2.43	20.0	9.0	8.2	0	291	21.0	278	192	86	901	9	25	1.300	500	90
9	26	01 20P	15	9.66	3.07	364.	46.	8.4	1.8	254	19.3	283	210	73	820	14	50	1.300	220	160
9	27	01 00P	15	9.53	2.94	41.0	8.0	8.4	2.0	256	19.3	278	193	85	820	12	35	10.900	490	280
9	28	09 50A	12	9.10	1.71	56.0	5.0	8.2	0	257	19.2	277	187	94	827	12	45	3.480	2.400	860
AV			12	9.45	2.04	83.4	7.4	8.2	0	241	20.3	287	172	101	846	11	37	7.900	2.700	740
11	07	09 30A	5	8.90	34.7	45.	17.	8.0	0			291			720	13	30	79.000	11.000	212.000
11	08	09 00A	4	6.83	14.2	50.	23.	8.1	0			293			826	13	30	49.000	*2.000	150.000
11	09	08 40A	5	6.40	16.1	188.	11.	8.0	0	208		290			775	12	30	33.000	1.400	130.000
11	10	07 45A	6	7.38	11.5	172.	20.	8.0	0	207		290			855	12	35	79.000	2.300	270.000
11	11	08 25A	6	7.90	16.8	47.	15.	8.0	0	206		289			769	12	30	79.000	500	220.000
11	12	08 15A	6	8.11	17.	51.	42.	8.0	0	206		289			781	11	25	240.000	2.300	450.000
11	13	08 55A	5	8.69	14.8	225.	20.	8.0	0	206		286			840	13	25	221.000	800	160.000
11	14	08 10A	3	8.87	14.6	57.	22.	8.0	0	206		288			769	8	35	70.000	800	490.000
11	15	09 05A	4	8.60	15.8	62.	32.	7.9	0	202		290			807	12	30	33.000	4.900	120.000
11	16	01 45A	4	9.39	24.4	139.	37.	7.9	0	207		287			819	12	75	79.000	600	200.000
11	17	02 45P	4	8.99	25.8	101.	26.	7.9	0	208		292			781	13	60	109.000	1.300	470.000
11	18	07 35A	3	8.96	20.6	129.	20.	7.9	0	206		287			807	12	40	109.000	600	620.000
11	19	04 50A	3	8.66	22.7	145.	36.	7.9	0	208		289			825	9	70	172.000	2.300	106.000
11	20	03 30A	3	8.68	25.9	98.	28.	8.0	0	208		290			787	14	45	70.000	2.700	90.000
AV			4	8.7	18.65	107.8	26.4	8.0	0	206		289			797	12	40	101.571	2.453	264.000

NOVEMBER - DECEMBER 1952

Month	Date	Sample Time	Temp °C	D O mg/l	B O D mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l (as CaCO3)	Alkal Total mg/l (as CaCO3)	Cl - mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spect. Conduct µmhos/cm	True Color Units	Turb Units	Coli MPN Per 100 ml	Fecal Coli MPN Per 100 ml	Fecal Strep Per 100 ml
11	30	09 45A		9.51	13.2	80	12											33,000	17,000	210,000
12	1	09 30A		9.62	8.0	58	11											13,000	7,900	330,000
12	2	09 45A		10.18	7.3	80	14											17,200	3,300	210,000
12	3	09 30A		9.53	2.8	45	10											10,900	4,900	120,000
12	4	09 40A		10.21	2.4	43	17											23,000	7,900	250,000
12	5	09 35A		10.62	3.5	69	12											49,000	17,200	300,000
12	6	08 00A		10.13	5.0	65	15											79,000	49,000	240,000
AV				10.0	6.31	62.6	13											32,157	15,314	237,143

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NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 7 (NP177.3)

Month	Date	Sample Time	Temp °C	D.O mg/l	B mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal. Phenol mg/l (as CaCO3)	Alkal. Total mg/l (as CaCO3)	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Specf. Conduct µmhos/cm.	True Color Units	Turb Units	Coli. M.P.N. Per 100 ml.	Fecal Coli MPN Per 100 ml.	Fecal Strep Per 100 ml.
9	22	12 05P	10	9.68	1.65	19.0	2.0	8.1	0	280	21.4	298	206	92	800	15	*25			1.900
9	23	07 30A	10	8.97	1.67	52.0	21.0	8.1	0	281	21.0	298	198	100	812	13	45	24.000	2.300	3.600
9	24	11 00A	10	9.06	1.60	116.	15.0	8.0	0	270	20.6	298	202	96	832	10	75	4.900	1.300	800
9	25	01 00P	14	9.41	3.48	34.0	5.0	8.2	0	273	21.8	297	204	93	847	10	30	6.300	1.100	170
9	26	02 15P	15	9.12	2.78	43.0	12.0	8.2	0	274	21.7	294	210	84	855	14	35	3.300	*200	90
9	27	01 55P	15	9.33	2.31	53.0	11.0	8.3	0	251	18.4	289	153	136	781	10	50	23.000	800	400
9	28	10 40A	13	9.34	2.04	51.0	2.0	8.3	0	250	18.1	286	192	94	812	12	50	2.300	1.300	220
AV			12	9.27	2.22	53.	9.	8.1	0	268	18.	294	195	99	819	12	*44	10.600	1.300	1.000
11	07	10 25A	6	7.86	21.0	88.	25.	8.0	0			316			740	12	55	172.000	11.000	288.000
11	08	07 36A	4	7.23	15.6	88.	34.	8.0	0			306			827	12	50	221.000	4.000	160.000
11	09	10 00A	6	7.27	22.4	115.	19.	8.0	0	218		309			787	13	55	120.000	2.000	126.000
11	10	06 45A	5	6.46	18.8	242.	40.	8.0	0	220		311			848	14	70	172.000	5.000	110.000
11	11	09 40A	7	7.06	15.	124.	29.	8.0	0	216		306			794	11	60	330.000	5.000	122.000
11	12	07 00A	6	6.90	14.5	115.	32.	8.0	0	215		304			775	12	55	109.000	5.000	350.000
11	13	10 10A	6	7.49	27.	130.	43.	7.9	0	215		304			848	12	50	172.000	2.000	160.000
11	14	06 55A	4	7.39	14.6	115.	28.	8.0	0	214		304			769	13	75	79.000	7.000	400.000
11	15	10 15A	4	7.77	15.4	110.	27.	8.0	0	216		304			775	9	55	478.000	8.000	240.000
11	16	12 30P	4	8.01	30.8	194.	42.	7.8	0	219		299			752	12	95	34.000	2.000	470.000
11	17	04 15P	4	7.94	19.6	185.	45.	7.9	0	220		304			775	13	95	141.000	13.000	340.000
11	18	06 30A	3	7.82	18.2	209.	48.	7.9	0	216		304			812	13	80	172.000	2.000	430.000
11	19	05 45A	3	7.55	21.8	210.	43.	7.9	0	220		305			832	13	110	79.000	8.000	370.000
11	20	02 35A	3	6.98	22.6	282.	58.	8.0	0	216		306			793	14	85	221.000	2.000	350.000
AV			4	7.4	19.79	157.6	36.6	7.9	0	217		305			795	12	70	186.143	5.429	279.714
NOVEMBER - DECEMBER 1962																				
11	30	10 15A		8.68	24.0	110	26											70,000	5,000	600,000
12	1	09 50A		8.83	15.0	123	26											27,800	9,400	890,000
12	2	10 10A		9.29	6.4	122	27											79,000	14,100	270,000
12	3	10 15A		8.72	6.6	80	13											46,000	4,900	350,000
12	4	10 10A		9.27	8.5	92	33											79,000	4,600	116,000
12	5	10 00A		10.18	7.5	102	25											46,000	7,900	720,000
12	6	08 20A		9.47	6.2	108	33											23,000	13,000	610,000
AV				9.21	10.60	105.3	26.1											52,971	8,414	508,000

* INDICATES LESS THAN

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
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RESULTS OF ANALYSES

STATION 10 (NP160.2)

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l (as CaCO3)	Alkal Total mg/l (as CaCO3)	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Specf Conduct µmhos/cm	True Color Units	Turb Units	Coli MPN Per 100 ml.	Fecal Coli MPN Per 100 ml.	Fecal Strep Per 100 ml
9	21	10 25A	15	7.54	5.19	75.0	19.0	8.0	0	294	26.8	310	213	97	870	13	45			810
9	22	07 45A	11	7.54	4.68	130.	15.0	8.0	0	272	25.4	282	196	86	775	12	90	1.090.000	70.000	22.000
9	23	11 15A	14	8.10	4.21	184.	33.0	8.1	0	288	24.5	298	207	91	827	14	75	90.000	40.000	4.200
9	24	07 40A	11	8.09	5.50	276.	16.0	8.1	0	287	22.3	296	207	91	870	11	120	230.000	50.000	7.000
9	25	07 30A	09	8.69	4.74	1293.	64.0	8.2	0	279	19.8	310	211	99	840	11	210	240.000	33.000	5.500
9	26	03 00P	16	7.90	5.87	789.	49.0	8.2	0	276	22.3	305	206	99	855	15	150	33.000	17.000	500
9	27	02 20P	16	8.28	3.00	510.	54.0	8.2	0	274	21.5	298	205	93	840	9	120	109.000	11.000	600
AV			13	8.02	4.74	465.	35.	8.1	0	281	23.2	300	207	93	841	12	115	299.000	37.000	5.800
11	07	11 50A	7	5.78	28.5	220.	48.	8.0	0			332			800	14	75	230.000	*20.000	750.000
11	08	06 25A	4	5.17	20.8	354.	54.	7.9	0			320			862	12	90	490.000	49.000	390.000
11	09	10 35A	7	5.10	19.6	366.	58.	7.9	0	246		322			832	13	95	240.000	23.000	1.040.000
11	10	08 35A	6	2.38	24.6	432.	77.	7.9	0	248		319			885	13	110	790.000	94.000	2.000.000
11	11	07 50A	6	2.37	32.4	490.	74.	7.9	0	245		324			813	14	170	700.000	11.000	1.680.000
11	12	08 25A	5	3.33	30.1	390.	62.	7.9	0	246		322			794	13	120	790.000	13.000	1.200.000
11	13	11 45A	7	4.51	26.2	360.	52.	7.9	0	240		320			892	18	120	330.000	2.000	510.000
11	14	07 45A	4	3.69	26.9	445.	66.	8.0	0	242		318			806	16	140	460.000	21.000	1.800.000
11	15	11 00A	4	4.50	24.8	398.	45.	7.9	0	242		320			826	17	140	172.000	23.000	700.000
11	16	03 20P	4	5.13	31.6	365.	61.	7.8	0	251		316			800	14	140	490.000	5.000	730.000
11	17	12 20P	4	4.71	31.9	425.	70.	7.8	0	247		318			813	17	160	790.000	14.000	750.000
11	18	08 15A	4	4.54	36.6	492.	86.	7.9	0	246		319			812	13	140	9.200.000	23.000	1.400.000
11	19	06 40A	3	4.42	29.9	522.	99.	7.8	0	241		319			870	17	150	490.000	49.000	2.000.000
11	20	01 55A	4	4.09	27.8	533.	96.	7.9	0	240		322			819	13	160	490.000	33.000	1.500.000
AV			4	4.27	27.99	414.3	68.	7.9	0	244		320			830	14	129	1.118.713	27.692	1.189.285
NOVEMBER - DECEMBER 1962																				
11	30	09 45A		8.42	26.9	130	23											109,000	49,000	1,350,000
12	1	09 30A		8.79	9.7	163	38											221,000	70,000	6,600,000
12	2	09 40A		9.40	5.1	113	33											490,000	221,000	1,670,000
12	3	09 25A		8.85	5.6	124	26											330,000	79,000	2,500,000
12	4	09 30A		9.40	5.6	149	40											175,000	70,000	1,270,000
12	5	09 30A		10.30	6.8	252	37											130,000	33,000	1,140,000
12	6	08 10A		9.43	9.6	153	40											79,000	49,000	1,220,000
AV				9.23	9.9	154.9	33.9											219,143	81,571	2,250,000

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NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES

STATION 11 (NP154.6)

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l as CaCO3	Alkal Total mg/l as CaCO3	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spec. Conduct µmhos/cm.	True Color Units	Turb Units	Coli. MPN Per 100 ml.	Fecal Coli MPN Per 100 ml	Fecal Strep Per 100 ml.
9	21	10 45A	16	8.79	4.69	120.	32.0	8.1	0	284	27.0	314	211	103	870	12	55			830
9	22	08 05A	11	8.12	5.02	125.	16.0	8.0	0	270	26.8	298	200	98	800	13	90	330.000	33.000	22.000
9	23	10 55A	13	8.50	3.35	337.	41.0	8.2	0	265	22.0	306	206	100	770	14	130	172.000	109.000	7.000
9	24	11 00A	10	8.89	4.72	467.	44.0	8.1	0	255	19.9	298	200	98	775	12	130	70.000	49.000	4.100
9	25	08 00A	10	9.21	5.14	707.	60.0	8.2	0	282	22.4	310	184	126	855	10	200	172.000	70.000	2.700
9	26	02 45P	16	8.14	6.66	499.	48.0	8.1	0	271	22.7	308	178	130	855	16	150	63.000	23.000	800
9	27	01 50P	16	8.30	2.90	357.	22.0	8.3	0	263	20.5	302	178	124	827	8	100	172.000	17.000	1.400
AV			13	8.56	4.63	373.	37.	8.1	0	270	23.0	305	193	111	821	14	122	163.000	50.000	5.500
11	07	12 05P	6	5.62	17.0	188.	37.	8.0	0			332			814	12	70	230.000	*20.000	300.000
11	08	06 45A	4	5.48	16.4	347.	66.	7.9	0			319			832	13	80	790.000	33.000	490.000
11	09	10 10A	6	5.25	19.2	405.	59.	7.9	0	242		326			827	13	100	790.000	49.000	280.000
11	10	08 55A	6	4.62	19.	387.	44.	7.9	0	238		324			867	13	95	221.000	109.000	780.000
11	11	11 15A	8	4.55	24.1	492.	76.	7.9	0	245		322			826	14	150	221.000	170.000	640.000
11	12	08 45A	6	5.19	22.	414.	52.	7.9	0	246		322			800	9	100	278.000	13.000	800.000
11	13	10 15A	6	5.33	20.8	351.	53.	7.9	0	242		320			900	12	120	278.000	17.000	340.000
11	14	08 05A	4	5.69	20.8	317.	55.	8.0	0	237		318			806	13	110	330.000	49.000	620.000
11	15	10 40A	4	8.04	19.4	357.	54.	7.9	0	242		319			822	14	130	490.000	13.000	530.000
11	16	01 55P	4	6.01	24.8	323.	49.	7.8	0	246		319			813	12	120	174.000	33.000	470.000
11	17	12 45P	4	5.42	28.2	414.	81.	7.9	0	253		320			805	17	170	330.000	23.000	860.000
11	18	08 40A	2	6.38	26.3	417.	80.	7.9	0	242		320			825	13	150	490.000	79.000	790.000
11	19	04 55A	3	5.06	24.2	493.	84.	7.8	0	243		320			854	14	150	240.000	13.000	810.000
11	20	05 00A	2	6.06	23.6	672.	117.	7.9	0	250		321			832	14	160	330.000	23.000	390.000
AV			4	5.69	21.84	398.3	64.7	7.9	0	243		321			830	13	121	370.714	[illegible]	578.571

NOVEMBER - DECEMBER 1962

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l as CaCO3	Alkal Total mg/l as CaCO3	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spec. Conduct µmhos/cm.	True Color Units	Turb Units	Coli. MPN Per 100 ml.	Fecal Coli MPN Per 100 ml	Fecal Strep Per 100 ml.
11	30	09 00A		8.57	12.7	126	24											230,000	33,000	1,230,000
12	1	08 45A		9.23	7.2	127	12											108,000	23,000	560,000
12	2	09 00A		9.70	7.3	130	32											79,000	17,000	330,000
12	3	08 45A		9.40	5.3	117	23											79,000	33,000	760,000
12	4	08 50A		9.80	5.7	151	38											141,000	38,000	470,000
12	5	08 40A		10.38	6.2	130	32											130,000	79,000	570,000
12	6	07 40A		9.87	8.7	127	36											348,000	172,000	560,000
AV				9.59	7.59	131	28.4											166,571	55,714	640,000

* INDICATES LESS THAN

NORTH PLATTE RIVER SURVEY •
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 14 (NP141.8)

Month	Date	Sample Time	Temp. °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l as CaCO3	Alkal Total mg/l as CaCO3	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spec Conduct µmhos/cm	True Color Units	Turb Units	Coli MPN Per 100 ml	Fecal Coli MPN Per 100 ml	Fecal [illegible] Per 100 ml
9	21	12 20P	16	8.60	4.50	140.	22.4	8.1	0	278	24.5	316	112	106	832	9	85			360
9	22	09 15A	11	6.93	3.07	122.	5.0	8.2	0	262	23.5	306	171	135	763	13	120	49.000	3.300	4.200
9	23	07 45A	10	9.03	3.15	226.	39.0	8.2	0	269	23.1	302	88	214	776	15	150	21.000	13.000	5.300
9	24	08 45A	10	8.85	3.82	162.	25.0	8.1	0	267	23.3	306	72	234	848	14	140	33.000	23.000	5.700
9	25	08 50A	10	9.56	2.87	792.	42.0	8.3	0	265	21.4	310	196	114	819	10	160	46.000	*2.000	1.800
9	26	12 50P	16	9.00	3.44	1036.	66.0	8.3	0	264	22.3	310	146	164	855	14	210	49.000	7.000	1.100
9	27	11 40A	14	9.09	3.07	234.	25.0	8.3	0	268	21.7	312	167	145	848	14	120	34.800	4.900	2.100
AV			12	9.00	3.42	387.	32.3	8.1	0	268	22.8	309	136	158	819	12	126	38.800	8.900	3.000
11	07	02 05P	7	8.34	17.	245.	42.	8.0	0			338			820	13	80	240.000	49.000	116.000
11	08	09 15A	4	8.73	16.	349.	54.	8.0	0			322			848	12	100	1.300.000	13.000	220.000
11	09	07 45A	4	8.05	17.	396.	39.	8.0	0	240		320			827	13	95	221.000	13.000	130.000
11	10	11 20A	7	8.10	14.4	391.	62.	8.0	0	236		326			870	14	100	221.000	17.000	14.000
11	11	09 15A	6	7.60	15.7	410.	45.	8.0	0	237		321			800	13	90	79.000	23.000	230.000
11	12	10 50A	6	8.41	14.6	631.	161.	8.0	0	236		322			812	7	120	109.000	13.000	540.000
11	13	08 30A	4	8.88	14.4	401.	46.	8.0	0	235		315			876	13	110	79.000	5.000	570.000
11	14	10 05A	4	9.05	14.4	321.	54.	8.0	0	232		324			806	12	110	221.000	5.000	300.000
11	15	08 30A	3	8.87	15.8	450.	84.	8.0	0	239		317			814	13	130	221.000	49.000	150.000
11	16	12 55P	2	9.56	17.2	416.	53.	7.9	0	242		324			807	13	120	490.000	8.000	400.000
11	17	02 50P	3	8.90	19.2	481.	85.	7.9	0	246		320			884	14	140	172.000	8.000	390.000
11	18	11 05A	2	9.26	24.4	366.	57.	7.9	0	235		324			825	12	130	430.000	17.000	230.000
11	19	03 20A	2	9.28	17.2	457.	83.	7.9	0	236		320			840	12	130	330.000	2.000	220.000
11	20	03 20A	1	8.70	22.4	369.	108.	8.0	0	240		320			832	13	100	172.000	5.000	410.000
AV			3	8.62	17.1	405.9	69.5	7.9	0	237		322			833	12	115	306.071	16.214	280.143
NOVEMBER - DECEMBER 1962																				
11	30	08 35A		9.93	10.9	128	24											94,000	11,000	207,000
12	1	08 20A		10.09	8.3	143	33											240,000	27,800	201,000
12	2	08 35A		10.50	4.9	180	35											49,000	33,000	230,000
12	3	08 20A		10.15	8.5	121	23											79,000	33,000	137,000
12	4	08 20A		10.80	10.5	123	33											240,000	240,000	240,000
12	5	08 25A		11.54	5.9	169	35											63,000	46,000	58,000
12	6	07 15A		11.10	6.8	146	42											79,000	79,000	182,000
AV				10.6	7.4	141.4	32.1											120,571	67,114	187,000

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NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 16 (OG173-1.5)

Month	Date	Sample Time	Temp. °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l (as CaCO3)	Alkal Total mg/l (as CaCO3)	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spect Cond µmhos/cm	True Color Units	Turb Units	Coli MPN Per 100 ml.	Fecal Coli MPN Per 100 ml	Fecal Strep Per 100 ml
9	22	03 00P	17	5.10	17.4	27.0	9.0	8.0	0	337	48.6	275	175	103	943	22	50	230,000	49,000	51,000
9	23	01 30P	16	6.12	5.17	25.0	22.0	7.9	0	393	37.4	350	240	110	970	19	*25	79,000	33,000	29,000
9	24	11 25A	13	6.10	17.4	39.0	27.0	8.1	0	382	38.1	339	233	106	1020	36	70	348,000	348,000	200,000
9	25	08 30A	13	7.66	1.32	4.0	4.0	8.1	0	371	41.4	336	229	109	1030	8	*25	348,000	348,000	6,200
AV			15	6.24	10.4	23.8	15.	8.	0	378	41.3	326	219	107	990	23	*23	251,030	194,500	73,000
11	07	11 10A	36															1,720,000	230,000	12,000,000
11	08	05 30A	38		201.	4225.	348.	7.7		266		312			762	44	800	2,400,000	140,000	17,700,000
11	09	11 25A	36		324.	2224.	236.	7.6		208		305			832	46	900	4,900,000	1,300,000	186,000,000
11	10	07 40A	35		197.	2636.	340.	7.6		209		314			825	50	1000	34,800,000	170,000	35,000,000
11	11	11 50A	35		392.	3348.	400.	7.5		212		307			757	55	1200	14,000,000	80,000	91,000,000
11	12	07 30A	34															7,900,000	20,000	29,000,000
11	13	12 25P	35															7,900,000	130,000	43,000,000
11	14	07 00A	33															3,300,000	50,000	20,000,000
11	15	11 50A	32															7,900,000	110,000	18,000,000
11	16	04 20P	36															17,200,000	330,000	12,000,000
11	17	04 25P	32															13,000,000	80,000	17,000,000
11	18	07 10A	36															17,200,000	20,000	20,000,000
11	19	07 30A	34															17,200,000	20,000	19,000,000
11	20	01 10A	32															13,000,000	20,000	42,000,000
AV			34		278.5	3108.2	331.	7.6	0	223		309			794	48	975	11,601,429	192,857	40,121,429

NOVEMBER - DECEMBER 1962

Month	Date	Sample Time	Temp. °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l
11	30			-	240	1448	215
12	1			-	174	1738	338
12	2			-	180	1522	232
12	3			-	182	1600	258
12	4			-	253	1870	500
12	5			-	248	2304	470
12	6			-	161	1530	190
AV				-	206.3	1724.6	314.7

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NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 19 (BT208.8)

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l (as CaCO3)	Alkal Total mg/l (as CaCO3)	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spec. Conduct µmhos/cm.	True Color Units	Turb. Units	Coli. MPN Per 100 ml.	Fecal Coli MPN Per 100 ml	Fecal Strep Per 100 ml
11	07	07 45A	42															7.900.000	170.000	90.000.000
11	08	10 57A	38															4.900.000	170.000	28.000.000
11	09	07 00A	41															7.900.000	50.000	102.000.000
11	10	10 25A	38															3.300.000	80.000	90.000.000
11	11	06 30A	38															4.900.000	*20.000	114.000.000
11	12	09 55A	46		1170.	1488.	320.	7.2		235		394			692	100	900	*20.000	*20.000	100.000
11	13	07 05A	34		1360.	441.	98.	9.6	48.2	268		453			980	190	900	10.900.000	20.000	19.000.000
11	14	10 15A	40		1030.	1820.	332.	6.9	0	226		476			901	100	1100	7.700.000	50.000	39.000.000
11	15	07 15A	36		1880.	1920.	552.	11.5	279.	559		710				360	1200	3.300.000	*20.000	171.000.000
11	16	03 40P	38															6.300.000	230.000	110.000.000
11	17	12 55P	38															3.300.000	20.000	93.000.000
11	18	09 25A	35															13.000.000	20.000	19.000.000
11	19	03 25A	34															4.900.000	*20.000	510.000.000
11	20	05 00A	35															13.000.000	80.000	340.000.000
AV			38		1360.	1417.2	325.5	8.8	81.8	322		508			924	187	1025	7.038.615	89.000	132.692.308

NOVEMBER - DECEMBER 1962

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l (as CaCO3)	Alkal Total mg/l (as CaCO3)	Cl⁻ mg/l	Hard mg/l	Ca mg/l	Mg mg/l	Spec. Conduct µmhos/cm.	True Color Units	Turb. Units	Coli. MPN Per 100 ml.	Fecal Coli MPN Per 100 ml	Fecal Strep Per 100 ml
11	30	08 10A		-	566	1978	227											-	-	-
12	1	08 15A		-	625	1296	204											2,210,000	2,210,000	68,000,000
12	2	08 30A		-	415	2188	228											13,000,000	4,900,000	28,000,000
12	3	08 25A		-	664	2440	306											-	-	-
12	4	08 30A		-	362	1450	192											-	-	-
12	5	08 35A		-	403	1470	194											490,000	109,000	10,300,000
12	6	07 10A		-	427	2698	438											10,900,000	7,000,000	135,000,000
AV				-	494.5	1931.4	255.6											6,650,000	3,554,750	57,825,000

* INDICATES LESS THAN

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES

STATION 20 (GM184-1.5)

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp. Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal Phenol mg/l (as CaCO₃)	Alkal Total mg/l (as CaCO₃)	Cl⁻ mg/l	Hard mg/l	Ca. mg/l	Mg mg/l	Specf. Conduct µmhos/cm	True Color Units	Turb. Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N. Per 100 ml	Fecal Strep. Per 100 ml.
11	07	09 10A	28															13.000.000	300.000	8.400.000
11	08	09 20A	24															17.200.000	490.000	6.300.000
11	09	08 30A	26															22.100.000	200.000	2.600.000
11	10	08 00A	31															10.900.000	*200.000	4.500.000
11	11	08 10A	24															7.900.000	200.000	6.100.000
11	12	08 35A	30		624.	4612.	752.	9.3	37.8	189		323			636	50	1600	13.000.000	200.000	1.400.000
11	13	08 45A	26		670.	5108.	872.	9.2	32.2	188		312			666	70	1800	542.000.000	7.900.000	16.200.000
11	14	08 30A	29		607.	5276.	824.	9.2	35.8	196		332			662	85	1800	7.000.000	*200.000	9.800.000
11	15	08 45A	29		764.	5636.	1056.	9.2	36.0	190		320				50	1800	2.200.000	*200.000	2.700.000
11	16	01 35P	24															10.900.000	*200.000	4.600.000
11	17	02 25P	26															13.000.000	*200.000	11.400.000
11	18	07 50A	24															24.000.000	*200.000	1.500.000
11	19	04 40A	28															4.600.000	*200.000	17.000.000
11	20	03 35A	27															13.000.000	*200.000	26.000.000
AV			26		666.25	5158.	876.	9.2	35.4	190		321			658	63	1750	50.057.143	1.548.333	8.321.429

NOVEMBER - DECEMBER 1962

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D. mg/l	Susp. Solids mg/l	Volatile Susp Solids mg/l
11	30			-	575	2661	479
12	1			-	530	3688	646
12	2			-	518	4236	774
12	3			-	469	3128	604
12	4			-	496	3794	690
12	5			-	409	3342	624
12	6			-	386	3996	746
AV				-	483.2	3549.3	651.9

* INDICATES LESS THAN

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NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 21 (GS173.8-3.0)

Month	Date	Sample Time	Temp. °C	D.O. mg/l	B.O.D mg/l	Susp. Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal. Phenol mg/l (as $CaCO_3$)	Alkal. Total mg/l (as $CaCO_3$)	Cl^- mg/l	Hard. mg/l	Ca mg/l	Mg mg/l	Spec. Conduct µmhos/cm.	True Color Units	Turb. Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N. Per 100 ml	Fecal Strep Per 100 ml.
11	07	03 50P	38															7,900,000	490,000	6,200,000
11	08	11 00A	30		1320.	5790.	872.	11.6	262.	513		772			1785	90	2000	2,400,000	50,000	570,000
11	09	11 40A	38		1250.	5516.	720.	9.1	62.0	258		446			953	220	1700	3,300,000	200,000	8,800,000
11	10	07 20A	36		1310.	5656.	1400.	11.3	222.	539		731			1610	270	1900	2,400,000	230,000	4,500,000
11	11	12 00A	33		1700.	6568.	800.	10.0	73.8	358		589			1390	190	2000	4,900,000	110,000	6,100,000
11	12	07 10A	35															2,210,000	*20,000	14,000,000
11	13	12 40P	37															*20,000	*20,000	16,200,000
11	14	06 40A	35															*20,000	*20,000	9,800,000
11	15	12 05P	37															3,300,000	330,000	60,000,000
11	16	04 35P	34															2,400,000	20,000	24,000,000
11	17	04 35P	34															2,780,000	50,000	14,000,000
11	18	06 45A	32															790,000	20,000	66,000,000
11	19	07 40A	30															4,900,000	50,000	10,200,000
11	20	12 55A	34															2,400,000	200,000	3,000,000
AV			34		1395.	5882.5	948.	10.5	154.9	417		634			1435	192	1900	3,306,666	159,091	20,240,714

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11	30	-	1347	6134	979
12	1	-	1264	8362	992
12	2	-	*2398	7716	942
12	3	-	1186	8324	944
12	4	-	2228	9118	1124
12	5	-	1468	12414	1306
12	6	-	1540	8292	1006
AV		-	1633	9051.4	1041.9

* INDICATES LESS THAN

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NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 22 (GB150-2.5)

Month	Date	Sample Time	Temp. °C	D.O mg/l	B.O.D mg/l	Susp. Solids mg/l	Volatile Susp. Solids mg/l	pH	Alkal. Phenol mg/l as CaCO3	Alkal. Total mg/l as CaCO3	Cl⁻ mg/l	Hard mg/l	Ca. mg/l	Mg. mg/l	Spect. Conduct. μmhos/cm.	True Color Units	Turb. Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N. Per 100 ml	Fecal Strep. Per 100 ml.
11	07	12 30P	32															230,000	*20,000	7,500,000
11	08	07 15A	31															16,000,000	63,000	11,000,000
11	09	09 45A	31															16,000,000	141,000	12,400,000
11	10	09 20A	32															3,300,000	70,000	42,000,000
11	11	11 00A	34															3,300,000	200,000	19,000,000
11	12	09 10A	30															790,000	80,000	13,000,000
11	13	10 40A	31															3,300,000	*20,000	9,000,000
11	14	08 25A	30															10,900,000	20,000	8,000,000
11	15	10 15A	29															7,900,000	20,000	10,000,000
11	16	02 15P	32		550.	4952.	792.	8.9	20.6	204		340			770	55	1200	4,900,000	*20,000	11,000,000
11	17	01 05P	32		576.	6392.	976.	9.0	23.4	210		355			769	55	2300	10,900,000	*20,000	11,200,000
11	18	09 05A	29		606.	5796.	944.	8.9	21.2	198		324			775	48	1700	24,000,000	20,000	20,000,000
11	19	06 10A	24		600.	7512.	880.	8.9	18.2	224		355			800	50	2300	4,600,000	20,000	6,300,000
11	20	02 10A	26															7,900,000	*20,000	9,400,000
AV			30		583.0	6163.	898.	8.9	20.8	209		340			779	52	1875	8,144,286	70,444	16,000,000

NOVEMBER - DECEMBER 1962

Month	Date	D.O mg/l	B.O.D mg/l	Susp. Solids mg/l	Volatile Susp. Solids mg/l
11	30	-	632	3940	656
12	1	-	578	4522	762
12	2	-	337	3278	498
12	3	-	864	4240	664
12	4	-	489	3634	658
12	5	-	658	7892	1290
12	6	-	922	4294	758
AV		-	639.9	4542.9	755.1

* INDICATES LESS THAN

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
SEPTEMBER & NOVEMBER 1961
RESULTS OF ANALYSES
STATION 23 (CB190-2.0)

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D mg/l	Susp. Solids mg/l	Volatile Susp Solids mg/l	pH	Alkal. Phenol mg/l (as CaCO3)	Alkal Total mg/l (as CaCO3)	Cl⁻ mg/l	Hard. mg/l	Ca. mg/l	Mg. mg/l	Specf. Conduct µmhos/cm.	True Color Units	Turb. Units	Coli. M.P.N. Per 100 ml.	Fecal Coli M.P.N Per 100 ml	Fecal Strep Per 100 ml.
11	07	12 20P	6															490,000	*20,000	490,000
11	08	07 05A	1															2,400,000	20,000	640,000
11	09	09 55A	4															2,210,000	20,000	360,000
11	10	09 10A	3															4,900,000	*20,000	1,800,000
11	11	10 55A	8															490,000	*20,000	530,000
11	12	09 00A	4															1,720,000	*20,000	1,200,000
11	13	10 30A	4															2,400,000	20,000	630,000
11	14	08 15A	1															2,210,000	20,000	1,500,000
11	15	10 25A	2															270,000	*20,000	870,000
11	16	02 05P	1		174.	56.	44.	7.6	0	388		480			1052	50	90	790,000	*20,000	2,300,000
11	17	12 55P	2		176.	77.	57.	7.7	0	340		442			953	65	100	3,300,000	*20,000	1,100,000
11	18	08 55A	1		231.	56.	23.	7.7	0	342		444			951	55	60	3,300,000	*20,000	1,800,000
11	19	06 20A	0		236.	384.	73.	7.8	0	372		490			1041	50	240	790,000	*20,000	2,300,000
11	20	02 20A	0															1,720,000	*20,000	4,700,000
AV			2		204.25	143.2	49.2	7.7	0	355		464			999	55	122	1,927,857	20,000	1,444,286

NOVEMBER - DECEMBER 1962

Month	Date	Sample Time	Temp °C	D.O. mg/l	B.O.D mg/l	Susp. Solids mg/l	Volatile Susp Solids mg/l
11	30			-	272	38 x	32
12	1			-	305	58 x	55
12	2			-	*359	49 x	46
12	3			-	*339	77 x	41
12	4			-	330	115 x	62
12	5			-	258	54 x	-
12	6			-	273	85 x	59
AV				-	305	68	49.2

* INDICATES LESS THAN
x - MILKY - WHITE, DIFFICULT TO GET 100 ML FILTERED

APPENDIX B

D. A. Townley

GUIDE FOR WATER POLLUTION CONTROL ACTIVITIES, MISSOURI DRAINAGE BASIN

Adopted January 7, 1954

Engineering Section

Missouri Basin Health Council

Subject to (a) such higher objectives as may be desired by any State and (b) such other modification as may be deemed necessary, after appropriate investigation, by the State Water Pollution Control Agency concerned, the Engineering Section, Missouri Basin Health Council recommends the following for consideration by the member States as a tentative guide for water pollution control activities in the Missouri Drainage Basin:

1. Toxic substandes including metallic ions, phenolic compounds, oils, alkalies, and acides should be virtually eliminated from sewage effluents.
2. Removal of settleable and floating solids to prevent sludge banks, floating materials, and nuisance conditions should be required as the minimum acceptable treatment.

3. For industrial wastes similar in nature to municipal wastes, treatment should be based on the same premise as recommended for municipalities. For industrial wastes not comparable to municipal wastes, treatment should be provided as necessary to prevent deterioration of water quality for beneficial uses in the receiving stream.

4. Additional treatment over that specified in Item 2 above should be provided as necessary to protect downstream water uses. Quality objectives for certain water uses are:

   (a) For water serving as a source of domestic supply, raw water bacterological quality should conform to that recommended in "Manual of Recommended Water Sanitation Practices, 1946, Public Health Bulletin #296," pages 11-13.

   (b) "For bathing or swimming waters, monthly arithmetical average 'most probable number' of coliform organisms should not exceed 1,000 per 100 ml during any month of the recreation season; nor exceed this number in more than 20 percent of the "samples examined during any such month; nor exceed 2,400 per 100 ml on any day. For nonbathing or nonswimming waters, the monthly arithmetical average 'most probable number' of coliform organisms should not exceed 5,000 per 100 ml in any month of the recreational season, nor should exceed this number in more than 20 percent of the samples examined during any such month."

(c) For fish and aquatic life a minimum oxygen concentration of 5.0 ppm. is desirable in waters otherwise offering suitable fishery habitat, with 6.0 ppm. for trout streams.

(d) For bacteriological quality of irrigation water:

(1) Sewage used for irrigation of forage crops should be given treatment insuring a consistent reduction in coliform bacteria of not less than 90 percent.

(2) Sewage used for irrigation of human food crops should be given treatment

insuring a consistent reduction (a) in suspended solids of not less than 75%, (b) in 5 day 20°C. B.O.D. of not less than 75% and (c) in coliform bacteria of not less than 98 percent, unless discharged into a stream where the volume of dilution water, available during the low flow periods during which irrigation diversions may occur, is at least 10 times greater than the anticipated maximum daily volume of sewage, in which case a bacterial reduction of 90 percent may be acceptable. Provided, however, that where the time of passage from plant discharge to irrigation diversion is such as to permit the normal death rate of bacteria as evidenced by the die-away curve to provide equivalent bacterial reduction, the requirement of (1) and (2) above may be appropriately modified.

* * *

MR. SAMSON: Is that the report dated November 30 and December 6, 1962, "Report of Survey of North Platte River"?

MR. TOWNLEY: Yes, sir, it is.

MR. SAMSON: Do we have a copy of the supplemental report?

MR. TOWNLEY: You have it before you.

This study, as I intimated before, was made on October 14 of this year -- rather, the week of October 14. Again, we had the assistance of the Wyoming and Nebraska Departments of Health, and the full cooperation of the principal industries and municipalities involved.

This report is entitled, "Report of Supplemental Survey, North Platte River, Torrington, Wyoming-Bridgeport, Nebraska, October 14-26, 1963."

A special survey of the interstate reach of the North Platte River (Wyoming-Nebraska) was made October 14 through 26, 1963, by the Public Health Service and the States of Wyoming and Nebraska. This survey was made at the request of the States of Wyoming and Nebraska and the Holly Sugar Corporation.

The primary purpose of the survey was to determine the source of the high bacteriological concentration found in the interstate reach of the North Platte River, to up-date

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chemical and biological data pertaining to this reach of the river, and to evaluate effectiveness of waste treatment facilities installed since the survey of November-December 1962.

The analyses performed on samples collected from river sampling stations (see Table I) were as follows:

Dissolved oxygen
Biochemical oxygen demand
Suspended solids
Suspended volatile solids
MPN - Total coliform
MPN - Fecal coliform

Station numbers in Table I agree with the numbering on the proceeding surveys of this reach of the river. This shows the sampling stations, one at Torrington, Wyoming, which is the control station; and then we have five or six more stations, one at the State line; and then five more stations downstream.

(Table I is as follows:)

TABLE NO. I

List of Sampling Stations

Station 1	North Platte River at Torrington Bridge
Station 1A	Right Bank North Platte River (NP 201±) Data for Holly Plant Survey
Station 1C	Cherry Creek Drain
Station 1K	Katzer Drain
Station 19	Holly Sugar Corporation outfall
Station 2	North Platte River at Henry Bridge
Station 5	Mitchell Bridge
Station 7	North Platte River at Scottsbluff 20th Street Bridge
Station 16	Gering Great Western Plant Outfall
Station 10	North Platte River at McGrew Bridge
Station 11	North Platte River at Bayard Bridge
Station 14	North Platte River at Bridgeport Bridge

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HYDROLOGIC DATA

North Platte River flows (Table II) were determined by the Wyoming State Hydrographer, Torrington, Wyoming, and the Nebraska Department of Water Resources, Bridgeport, Nebraska. The Wyoming State Hydrographer also made flow determinations on the Holly Sugar Corporation Plant outfall (Table III). These determinations, reported as average daily flow were compiled from several daily determinations.

(Tables II and III are as follows:)

TABLE NO. II - STREAM FLOW IN CFS

Sampling Station Number, Location and River Mile

DATE	1 Torrington 208.8	1C Cherry Creek	1K Katzer	2 Henry 199.0	5 Mitchell 184.0	7 Scottsbluff 177.3	10 McGrew 160.2	11 Bayard 154.6	14 Bridgeport 141.8
10/14/63	362	15.3	11.6	380	705.	860.	1040.	1050.	1570.
10/15/63	309	14.5	11.2	362	695.	860.	1040.	1060.	1550.
10/16/63	292	14.1	11.2	344	686.	870.	1050.	1060.	1540.
10/17/63	310	13.7	11.2	362	690.	855.	1040.	1050.	1510.
10/18/63	310	13.7	10.8	362	686.	870.	1050.	1060.	1500.
10/19/63	368	13.7	10.8	380	674.	860.	1040.	1050.	1490.
AVERAGE	319	14.2	11.1	365	689.	863.	1043.	1055.	1526.

TABLE NO. III - INDUSTRIAL FLOW IN CFS*

PLANT	DATES 10/14	10/15	10/16	10/17	10/18	10/19	10/20	10/21	10/22	10/23	10/24	10/25
Holly Plant, Sta. 19			6.76	8.80	8.96			6.53	7.42	7.05	7.08	5.99

* Average flow (37 measurements) - 7.32

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PHYSICAL OBSERVATIONS

In the past four years, great strides have been made in providing waste treatment facilities by industries and municipalities along the reach of the North Platte River under consideration (Table IV). This Table IV delineates a record of this progress beginning at Torrington, Wyoming. The municipal plant at Torrington was completed in 1959. Now, this has no bearing on the action of this conference, but it does indicate the attitude and cooperation of the people in this valley in cleaning up the river.

Substantial improvement has been made in the levees forming the holding ponds at Scottsbluff and Bayard Great Western Sugar Plants; however, during the week of October 14, 1962, it was noted that significant quantities of raw wastes from the Bayard Great Western Plant were bypassing the treatment device.

(Table IV is as follows:)

TABLE NO. IV

PROGRESS IN CONSTRUCTION

POLLUTION ABATEMENT FACILITIES
(North Platte River - Torrington, Wyo. to Bridgeport, Nebr.)

Source[1]	Status	Estimated Completion Date	Remarks
WYOMING			
Torrington	Completed 1959		Operating
Holly Sugar Corp.	Completed 1962		Operating
NEBRASKA			
Henry	Completed 1962		Operating
Lyman	Planning		
Morrill	Completed 1963		Operating
Mitchell	Completed 1963		Operating
G.W. Sugar Co.	Completed 1963		Operating
Scottsbluff	Completed 1962		Operating
G.W. Sugar Co.	Completed 1962		Operating
Terrytown	Planning		
Gering	Planning		
G.W. Sugar Co.	Site acquired		
Minatare	Planning		
Melbeta	Completed		Operating
Bayard			No Progress
G.W. Sugar Co.	Remodeled 1962		Operating
Bridgeport	Planning		Bids Received
Broadwater	Planning		

---

[1] Industrial waste to municipal system except as noted.

THE SURVEY

During the week of October 14-19, 1963, samples for bacteriological and chemical analyses were collected from the aforementioned sampling stations (Table I). A biological survey of the river was conducted during that week and, during the week of November 4, further biological studies of the river were conducted. The biological report will be offered as a supplemental report.

A plant survey of the Holly Sugar Corporation was conducted during the week of October 21, 1963, to determine specifically the origin of the high bacteriological contamination found in the river. The bacteriological report will be offered as a supplemental report.

RESULTS OF THE SURVEY

Laboratory data concerning each of the river samples are tabulated at the end of this supplemental report. In general, conditions of the interstate reach of the North Platte River during the current beet sugar campaign are comparable to those outlined in the report of the 1962 survey.

Graphically, improvement of water quality in the Torrington, Wyoming-Bridgeport, Nebraska reach of the North Platte River is illustrated by Figures 1-S and 2-S. Fecal coliform organism concentrations in thousands per 100 ml are shown at river stations from Torrington, Wyoming, to Bridgeport, Nebraska (Figure 1-S). Values, reading from left to right, are shown for September 1961, November 1961, November-December 1962 and October 1963, respectively, for each station. The September 1961 survey was made prior to the beet sugar campaign and a survey was made during each of the succeeding beet sugar campaigns.

Station No. 1 at Torrington, Wyoming, is the control point; Station No. 2 is very near the State line (Wyoming-Nebraska), and other stations are located downstream from the State line.

MR. STEIN: Mr. Townley, I know you have gone over these, but can you be more specific about "planning"? What does that mean?

MR. TOWNLEY: Well, Mr. Chairman, the details I don't have, but the planning would mean anything from a preliminary engineering report to the completion of final plans and specifications. The Nebraska people advise that this planning in their opinion is tantamount to the construction of waste treatment facilities in the near future.

MR. STEIN: What do you mean by the near future?

MR. TOWNLEY: I don't know -- I would like to call --

MR. STEIN: We will wait for the State. I thought you might have it.

MR. TOWNLEY: I don't have the details on this.

Substantial improvement has been made in the levees forming the holding ponds at Scottsbluff and Bayard -- at the Great Western Sugar Plants. However, during the week of October 14, 1963, during that survey, samples for bacteriological and chemical analyses were collected from the aforementioned sampling stations. A biological survey of the river was conducted during that week and during the week of November 4 further biological studies of the river were conducted.

The biological report, Mr. Chairman, will also be offered as a supplemental report.

A plant survey of the Holly Sugar Corporation was conducted during the week of October 21, 1963, to specifically determine the origin of the high bacteriological contamination found in the river. This report will also be given later.

MR. SAMSON: Where was this sampling done at the Holly Sugar Corporation on the bacteriological?

MR. TOWNLEY: Within the plant, Mr. Samson.

MR. STEIN: I just want to make this clear: The reason why I raise this question about planning is, if there is going to be any question of bacteriological discharges from Wyoming down, we want to know whether this involves Holly or anyone else. I think it is significant as to when the municipal treatment plants which will remove bacteriological discharges are going to be constructed in Nebraska before we can deal with the bacteriological problems in the other States. That is why I asked that question. I hope it will be kept in mind.

MR. TOWNLEY: Figure 2-S reflects the results of treatment facilities which have been constructed since 1961. In September 1961 a total of 4,200 pounds per day of biochemical oxygen demand passed Station No. 1 at Torrington, Wyoming. The amount carried by the river did not materially change until at Station No. 10 the impact of wastes discharged in the Scottsbluff area increased the BOD to 15,000 pounds per day.

MR. SAMSON: I take it then that this is upstream from Torrington?

MR. TOWNLEY: It is right at the bridge. Right at the Torrington bridge.

MR. STEIN: Is this upstream from Torrington?

MR. TOWNLEY: No. It is in the municipality.

MR. SAMSON: I see. Very well.

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MR. TOWNLEY: The next figure is indicative of the improvement which has been made in the stream.

During November 1961, the total pounds of B.O.D. at Station No. 1 was 1,700, which increased to 82,000 pounds per day at the Wyoming-Nebraska State line, reflecting wastes discharged by the Holly Sugar Corporation at Torrington. An increase to 120,000 pounds per day at Station No. 10 reflected beet sugar wastes discharged by the Great Western Sugar Plants at Mitchell, Scottsbluff, and Gering, Nebraska. The B.O.D. in the stream decreased to 104,000 pounds and 98,000 pounds per day at Stations No. 11 and No. 14, respectively.

By comparison, in October 1963, the B.O.D. carried at Station No. 1 remained practically constant, but at the Wyoming-Nebraska State line (Station No. 2) a total of 9,700 pounds per day B.O.D. was measured, representing a decrease of 88 percent from the high of 82,000 in November 1961. The level at Station No. 10 decreased from 120,000 pounds B.O.D. per day in November 1961 to 14,400 pounds per day in October 1963 -- a decrease of 88 percent, reflecting the effects of waste treatment facilities operating at the Mitchell and Scottsbluff Great Western plants and at the City of Scottsbluff, Nebraska. The completion of treatment facilities at the Gering Great Western Plant and at Gering and Terrytown, Nebraska, will materially reduce quantities of B.O.D. at downstream points.

MR. STEIN: Before we get off that, is it safe to say that with these reductions in B.O.D. and with the completion of treatment facilities at Gering and at Terrytown, that B.O.D. will no longer be a problem adversely affecting water users in the river?

MR. TOWNLEY: It appears that if the present standard of operation is achieved or maintained by the Mitchell Great Western Plant treatment device, and by the Scottsbluff Great Western treatment facility, and by the one which will be constructed at Gering, this is true.

MR. STEIN: And this includes the reduction presently effected by the Holly Sugar Company too, in the system?

MR. TOWNLEY: You mean at this particular area?

MR. STEIN: At this particular time.

MR. TOWNLEY: I think that would be a safe statement. Yes.

MR. STEIN: Yes.

MR. TOWNLEY: As I pointed out in the beginning, this particular chart is merely to show the improvement in this one particular place.

MR. STEIN: Just to get this clearly for the record, as far as I can see, these were unusual conditions in

October 1963. We expect these reductions, if the plants are in operation, generally speaking, throughout the year, from year to year.

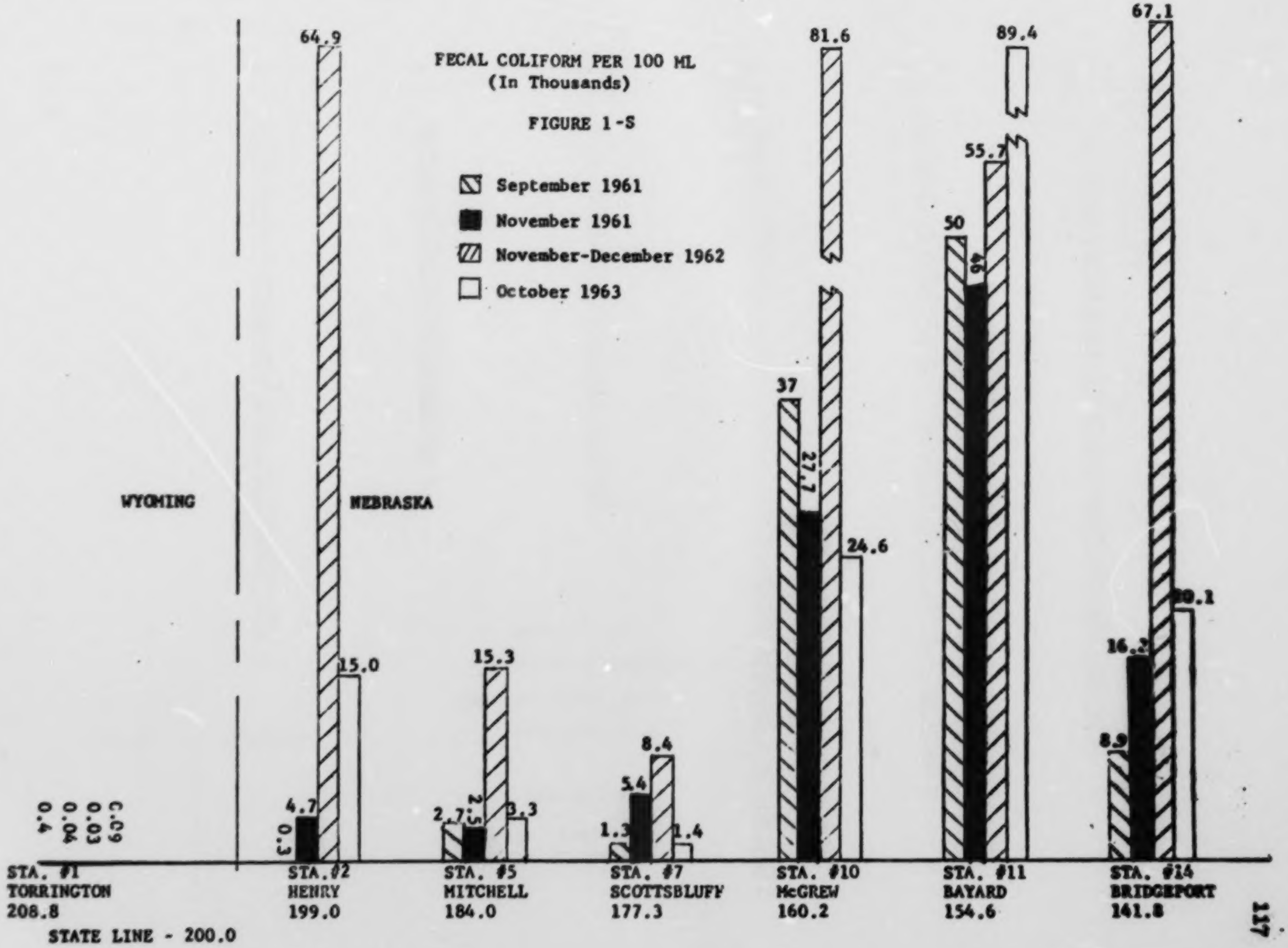
MR. TOWNLEY: There are several variables.

MR. STEIN: But generally speaking, this B.O.D. will not be a significant problem.

MR. TOWNLEY: I think that is true.

MR. STEIN: Thank you.

(Figures 1-S and 2-S are as follows:)



FECAL COLIFORM PER 100 ML
(In Thousands)

FIGURE 1-S

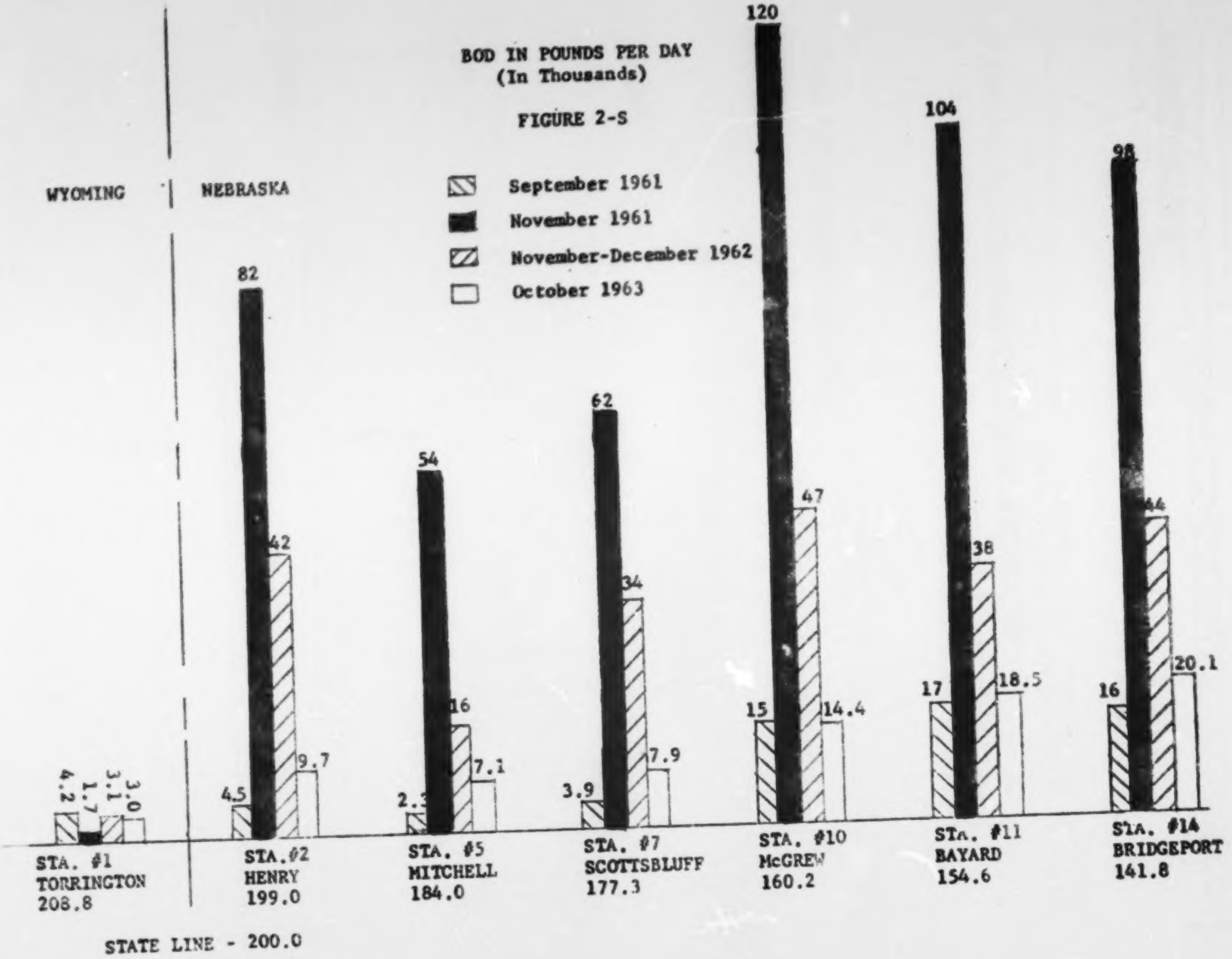

BOD IN POUNDS PER DAY
(In Thousands)

FIGURE 2-S

MR. TOWNLEY: SUMMARY AND CONCLUSIONS

This supplemental study was conducted by the Public Health Service and the States of Wyoming and Nebraska for the purpose of supplementing information contained in the 1962 survey.

Industries and municipalities in the area are making substantial progress in providing the necessary waste treatment facilities required to abate pollution in the North Platte River.

In the past year the Mitchell Great Western Sugar Plant has completed and put into operation a waste treatment facility and the municipality of Scottsbluff has also put a completed treatment plant into operation. Levees forming holding ponds at the Scottsbluff and Bayard Great Western Plants have been materially strengthened.

While a substantial improvement is noted in the quality of the water in the North Platte River at the Wyoming-Nebraska State line, interstate pollution is still occurring. Additional treatment of the Holly Sugar Corporation waste is necessary to eliminate interstate pollution and to restore the interstate reach of the North Platte River to the degree of water quality necessary to prevent interference with water uses in that section of the stream.

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Proposed Nebraska improvements will effectively control pollution now evident below the Wyoming-Nebraska State line.

(The tables following the statement of Mr. Townley are as follows:)

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 1 (NP 208.8)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	9:45A	12	---	1.80	5.6	2.0	8.2	330	50
15	8:05A	9	8.75	3.25	10.4	3.2	8.1	700	130
16	8:20A	10	8.8	1.30	11.6	4.8	8.1	790	110
17	8:10A	10	8.7	1.20	2.8	2.0	8.1	1480	110
18	8:05A	8	8.8	1.45	16.0	4.8	8.1	700	50
19	6:15A	8	8.15	1.30	5.2	0.4	8.1	330	80
Average			8.64	1.72	8.6	2.9	8.1	722	88

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 1A (NP 201 ±)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	11:00A	14	----	4.80	29.2	4.4	8.2	790,000	< 2,000
15	8:50A	10	8.25	14.38	35.2	8.4	8.2	330,000	< 2,000
16	9:15A	12	8.45	4.75	36.4	6.8	8.1	920,000	1,700
17	8:45A	10	8.30	5.40	22.8	6.0	8.1	542,000	22,100
18	8:45A	10	8.20	7.05	24.0	6.4	8.1	172,000	4,900
19	7:00A	10	7.15	3.55	28.0	5.2	8.1	1,600,000	49,000
Average			8.07	6.66	29.3	6.2		725,660	19,425

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 1C (NP 205 ±)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	---	--	----	----	-----	----	---	-----	-----
15	---	--	----	----	-----	----	---	-----	-----
16	8:00A	6	9.95	2.70	131.5	21.5	8.4	4,600	490
17	7:45A	9	9.50	2.45	157.0	23.5	8.3	17,200	490
18	7:45A	6	9.45	2.40	190.0	10.0	8.4	4,900	330
19	6:00A	7	8.70	2.50	172.0	2.8	8.4	7,900	1,300
Average			9.40	2.51	162.6	14.5		8,650	652

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 1K (NP 200.3±)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	----	--	----	----	----	-----	---	-----	-----
15	----	--	----	----	----	-----	---	-----	-----
16	9:30A	8	11.15	2.10	32.8	6.8	8.4	7,900	790
17	9:00A	7	10.70	1.40	20.0	5.6	8.4	4,600	1,720
18	9:05A	5	10.75	1.65	43.0	9.6	8.4	13,000	700
19	7:00A	7	9.20	1.60	42.0	3.2	8.4	4,900	2,300
Average			10.45	1.69	34.5	6.3		7,600	1,377

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 2 (NP 199)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	11:25A	14	----	4.45	22.8	2.8	8.2	790,000	< 2,000
15	9:15A	12	8.50	10.75	37.6	11.2	8.2	2,400,000	5,000
16	10:00A	12	8.40	3.70	35.2	6.4	8.2	1,300,000	-----
17	9:15A	10	8.70	2.20	39.2	8.4	8.1	790,000	4,000
18	9:15A	9	8.30	4.90	38.9	8.8	8.1	542,000	2,200
19	7:[illegible]	9	7.65	3.70	36.0	5.2	8.1	1,600,000	49,000
Average			8.51	4.95	34.9	7.1		1,237,000	15,050

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 5 (NP 184)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	11:50A	12	---	2.20	43.6	5.2	8.2	330,000	< 2,000
15	9:50A	11	8.75	2.35	66.0	10.4	8.2	230,000	7,000
16	10:40A	12	8.90	2.25	96.8	10.4	8.2	172,000	1,100
17	9:40A	11	8.70	1.55	87.6	9.6	8.2	240,000	1,300
18	9:45A	11	8.70	1.25	72.0	10.8	8.2	130,000	2,200
19	7:55A	9	8.15	1.75	98.5	6.5	8.2	141,000	4,900
Average			8.64	1.90	77.4	8.8		207,166	3,300

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 7 (NP 177.3)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	12:15P	13	----	2.20	97.6	9.6	8.2	230,000	2,000
15	10:10A	12	8.80	2.00	106.0	11.6	8.2	278,000	2,000
16	11:00A	13	9.00	1.45	104.0	9.2	8.2	49,000	1,400
17	10:00A	10	8.80	1.55	81.6	9.2	8.2	49,000	1,300
18	10:10A	12	8.90	1.60	110.4	14.8	8.2	175,000	1,300
19	8:10A	10	8.40	1.35	76.5	9.5	8.2	54,200	490
Average			8.78	1.69	96.0	10.7		139,166	1,415

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 10 (NP 160.2)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	----	--	---	----	----	----	---	----	----
15	10:00A	13	8.30	3.00	121.6	15.6	8.2	330,000	21,000
16	9:45A	13	8.20	2.50	98.4	16.8	8.2	542,000	7,900
17	9:10A	12	8.00	2.70	158.8	25.2	8.2	348,000	49,000
18	8:45A	12	8.10	2.45	83.0	13.0	8.2	240,000	14,100
19	7:05A	12	7.40	2.20	78.0	12.0	8.1	920,000	31,000
Average			8.00	2.57	93.9	16.5		476,000	24,600

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 11 (NP 154.6)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	----	---	---	---	----	----	--	----	----
15	9:25A	13	8.20	2.75	192.4	24.8	8.2	1,090,000	230,000
16	9:10A	12	8.10	3.15	96.0	17.6	8.2	172,000	109,000
17	8:40A	12	8.30	3.30	113.6	17.6	8.2	542,000	49,000
18	8:20A	11	7.80	4.30	120.5	18.5	8.2	490,000	26,000
19	6:35A	12	8.20	2.75	107.0	14.0	8.2	109,000	33,000
Average			8.12	3.25	125.9	18.5		408,600	89,400

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 14 (NP 141.8)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH	COLI. M.P.N. per 100 ml	FECAL COLI. M.P.N. per 100 ml
October									
14	----	---	---	----	----	----	---	----	----
15	8:25A	12	8.85	2.25	221.6	26.4	8.3	230,000	3,300
16	8:15A	12	8.65	3.15	102.8	18.0	8.3	141,000	17,200
17	8:00A	12	8.60	2.35	121.2	17.2	8.3	79,000	17,200
18	7:45A	11	8.65	2.40	134.0	16.5	8.2	221,000	22,100
19	8:05A	12	8.50	2.00	110.0	14.5	8.3	46,000	10,900
Average			8.65	2.43	137.9	18.5		143,400	20,080

NORTH PLATTE RIVER SURVEY
WYOMING - NEBRASKA
October 1963

RESULTS OF ANALYSIS
Station 16 (NP 173-1.5)

DATE	SAMPLE TIME	TEMP C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH
October 14	----	---	---	---	----	-----	---
15	7:25A 10:30A 12:30P	38 40 38		364	1172	200	7.3
16	7:20A 10:15A 12:15P	36 40 41		283	818	110	8.1
17	7:05A 9:45A 11:45A	34 28 34		585	618	164	8.7
18	6:55A 9:25A 11:30A	34 36 34		258	970	134	7.7
19	5:15A 7:35A 9:30A	38 36 36		276	710	150	7.6
Average				353	858	152	

NORTH PLATTE RIVER SURVEY
Wyoming - Nebraska
October 1963

RESULTS OF ANALYSIS
Station 19 (NP 208.8)

DATE	SAMPLE TIME	TEMP. C	D.O. mg/1	B.O.D. mg/1	SUSP. SOLIDS mg/1	VOLATILE SUSP. SOLIDS mg/1	pH
October							
14	----	--	---	----	-----	---	---
15	8:10A 11:30A 1:30P	34 33 33		185	1,880	276	7.2
16	8:30A 12:00N 2:00P	31 32 33		193	1,954	194	7.7
17	8:15A 10:55A 12:55P	32 29 33		195	2,564	308	7.8
18	8:10A 11:00A 1:00P	33 31 32		248	2,912	372	10.3
19	6:20A 9:30A 11:30A	33 33 31		236	2,684	260	6.9
Average				211	2,399	282	

DR. SAMPSON: Mr. Stein, I want to question that statement. I want to know what the basis for the statement is, because I don't think your facts substantiate that. I think that the Holly Sugar Company has in fact exceeded what was required of them, and I think that it is very easy sometimes to say this industry or that industry is the particular agency when it may be something else. What are you basing that on? Is it the B.O.D. You said that was reduced. What is it on?

MR. TOWNLEY: Dr. Sampson, there are two or three more reports that are to be presented here which may in themselves answer the question. That is, the biological and the bacteriological.

DR. SAMPSON: If you are singling out a single industry in a conclusion and you have to have a couple of addenda to explain it, that is a little bit unfair to that particular industry.

MR. TOWNLEY: This actually is a supplemental report of the one which we discussed here, Dr. Sampson, of last June.

MR. STEIN: To clarify this, I think this is a procedural operation and I think Dr. Sampson's point is well taken here.

MR. BORTHWICK: Can that conclusion be stricken from the record until it is cleared up?

MR. STEIN: I was just going to make this suggestion. It seems to me that the summary of conclusions made at this point in time should come after the biological report and the bacteriological report. Is this correct?

MR. TOWNLEY: We have no objection to that.

MR. STEIN: If there is no objection I think that would be better.

DR. SAMPSON: After all the facts are in, I may buy it.

MR. STEIN: I think this might be a way of orderly presentation. I think the difficulty was that there are two more aspects of the report, and the conclusions were read before these were put in. I think the point is well taken and we will go on.

Do you have anything else?

MR. SAMSON: We in Nebraska would go along with that general premise. We have no objection to having the remarks stricken at this time, but, of course, I understand that there will be some other evidence coming in, and it may be at that time that the remarks can go in.

DR. SAMPSON: On the basis of this report I don't buy it.

MR. SAMSON: We have no objection.

MR. CLARE: I have no objection.

MR. WILLIAMSON: I don't think we ought to go into any detail on these.

MR. STEIN: You may not be able to answer this question. You said that during the week of October 14th it was noticed that significant quantities of raw wastes from the Bayard Great Western Plant were by-passing the treatment device. Did you or the investigators make any effort to determine why that was being done?

MR. TOWNLEY: We didn't check into the mechanics of how this was occurring.

MR. SAMSON: Mr. Burk has the full information.

MR. STEIN: We can wait for the full presentation.

MR. SAMSON: I think it might be well, Mr. Chairman, in view of the fact that the question was asked now, for the purpose of the record and continuity if Mr. Burk could explain what happened.

MR. BURK: I was merely going to answer the question that at the time this survey was made we put in a new installation. We were having trouble with it and one day in particularly, when they were there, we had our pump down working it over. This condition existed for three or four days. I can't tell you how long. But since that time I know that the operation has been satisfactory. I think

Don has been down there since then and we think that it is very satisfactory at the present time.

MR. STEIN: Thank you.

MR. SAMSON: For the purposes of the record, what Mr. Burk said is correct, that since this interruption, which apparently was an operational problem, that this thing has worked itself out all right as far as Bayard is concerned.

MR. TOWNLEY: We have seen it once since that time and at that time it was not discharging.

MR. STEIN: I have one other point on this Bayard operation, and I assume that there are others at Scottsbluff and at Bayard. As I understand it, there are no discharges to the stream. Is that correct? I understand that they are operating correctly.

MR. TOWNLEY: There is a discharge at Bayard, but not at Scottsbluff, and there has not been to date at Mitchell.

MR. STEIN: No discharge at Mitchell. What kind of discharge is there at Bayard?

MR. TOWNLEY: Actually, this has not been analyzed since the repair was made. The levees forming holding ponds at Bayard failed last year during the beet campaign, and during this past summer they remodeled it and at the same time as our study here there was no discharge.

Today, at this time, the effluent looks very good. It is very clear.

MR. STEIN: Just on physical appearance? Looking at it and not analyzing it?

MR. TOWNLEY: As I said, the device was remodeled this past summer and it was not discharging at the time of the survey. Therefore, we could not analyze the effluent.

MR. STEIN: When did you see the discharge?

MR. TOWNLEY: Yesterday.

MR. SAMSON: Would you give us a description of that device at Bayard? What type of operation is at Bayard?

MR. TOWNLEY: Well, they have the three holding ponds in series.

MR. SAMSON: And their approximate size?

MR. TOWNLEY: They are reported to be 120-some acres of total surface area. That is the report, and I assume Mr. Burk would have better information. But it has been reported that they are approximately the same size. Whether or not the bottom of these holding ponds is level, I don't have any information about the construction.

MR. SAMSON: They cover an area of 120 acres.

MR. TOWNLEY: Yes, and operate in series.

MR. SAMSON: The height of the dikes is approximately what?

MR. TOWNLEY: Variable.

MR. STEIN: You have no idea how far the effluent is coming up?

MR. TOWNLEY: It hasn't been measured; no.

MR. STEIN: You have no reason to believe that this discharge of effluent is harmful, do you?

MR. TOWNLEY: Apparently it was a good quality of effluent and you wouldn't anticipate any damage. I don't know about this.

MR. STEIN: All right. Thank you.

Mr. Clare, do you have anything?

MR. CLARE: One of the supplemental reports Mr. Townley referred to was a report by Mr. Jack Geckler, a biologist from the Public Health Service center in Cincinnati.

STATEMENT OF JACK R. GECKLER, BIOLOGIST, UNITED STATES DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, ROBERT A. TAFT SANITARY ENGINEERING CENTER, CINCINNATI, OHIO

MR. GECKLER: Biological collections and field observations to evaluate effects of waste discharge on aquatic life were made on the reach of the North Platte River from Torrington, Wyoming, to Bridgeport, Nebraska, in November 1962 and October and November 1963.

FISH

Electrofish sampling at 14 stations on the North Platte drainage system indicated a well balanced fish population above Torrington, Wyoming, with 16 kinds of fish including rainbow trout and 7 kinds of minnows; and a population reduction in both numbers of kinds and quality of fish in the main river stem below Torrington to Bridgeport, Nebraska. Wastes from Holly Sugar Corporation at Torrington, Wyoming, that included silt, beet tops and beet particles, stimulated the growth of filamentous bacterial slimes, adversely altered the quality of the fish population, and reduced to 10 or less the kinds of fish found downstream. No trout were observed at the State line and downstream to Scottsbluff; however, a three and one-half pound rainbow trout was taken near the west Scottsbluff, Nebraska bridge, approximately 21 miles below the State line, indicating sufficient recovery of water quality to support trout at the time of collection.

J. R. Oeckler

During the November 1961 fish survey of the same river stations, it was observed that at all stations below Torrington, Wyoming, the fish were concentrated in the shallow clear water areas at the margins of the stream where ground water seepage was entering the stream or in clear drains or tributaries. This reaction was attributed to the high turbidities in the main stream. In general, the main stream during November 1963 was not as turbid as in 1961, and the fish were not as concentrated within a small area but were more evenly distributed throughout the stream. This indicates a general reduction in turbidity as well as improved water quality.

Fish remained concentrated in clear water areas in 1963 at the river cross-section below the Holly Sugar Corporation, and at the Minatare, Nebraska, station. The turbidities at both stations were much greater than observed at other stations and more kinds and greater numbers of fish were concentrated in the clearer water, showing an avoidance reaction to the sugar beet wastes at these respective points. Rainbow trout were quite abundant on the opposite side of the river from the Holly Sugar Corporation outfall, and none were found on the effluent side. Turbidities at Minatare, attributable to the Great Western Sugar Plant at Gering, Nebraska, were greater than at any other station in Nebraska. Small grease balls were quite evident at Minatare and were observed downstream as far as Bridgeport, Nebraska.

Fish populations were dispersed at Bayard and Bridgeport, Nebraska. Rainbow trout were taken at Bayard, both in the main stream and also in the Bayard Sugar Plant waste ditch, which, at present, receives no wastes.

In a drainage ditch near Bridgeport where in 1961 fifteen kinds of fish were very abundant, only six species were collected in November 1963, and only a few individuals were observed indicating the water to be of such quality that fish were dispersed throughout the main stream.

The reach of the North Platte River from Torrington, Wyoming, to Bridgeport, Nebraska, has a great potential to develop a successful sports fishery, if waste loads are adequately treated or removed from the system. A rainbow trout spawning migration from McConaughy Reservoir up the North Platte River, and some of its tributaries, occurs annually from October through April. However, the upstream extent is limited because of seasonal waste loads. These trout, in the past, have been forced to enter only a few clear streams, thus concentrating themselves to the extent that natural food is inadequate, spawning conditions are crowded, and angling pressure is concentrated on a small reach of stream. If the North Platte River was cleared of wastes that fish now avoid, the upstream spawning migration would be extended. During the warmer months high stream temperatures will limit the number of resident trout. However, a warm water sports fishery could be developed to augment winter trout fishing providing water quality was such that game species could survive and propagate.

BOTTOM ORGANISMS

Above the Holly Sugar Corporation Plant outfall the stream supported 23 different kinds of bottom organisms including those normally associated with clean water. These clean water forms make up the major portion of fish food supplied by the stream. Clean water supports many different kinds of organisms whereas those waters fouled with organic wastes support very few different kinds.

Filamentous slime bacteria will often be found where organic waste loads contribute adequate nutrients, dissolved oxygen is present and where the water velocity is sufficient to remove waste products. Profuse growths of slime bacteria will cover and eliminate favorable stream organisms such as insects, crustacea and attached algae, either by covering suitable substrates and destroying natural homes or by developing on the organisms. Growths of bacterial slimes on organisms such as aquatic insects that serve as fish food would hinder the exchange of gases through the gill surfaces; thus suffocation or increased susceptibility to other causes of death would most probably occur.

The reach above Torrington represents clean water, as indicated by the bottom organisms. Below Torrington the stream was degraded and the number of different kinds of organisms was reduced and those present were covered with filamentous slime bacteria.

MR. SAMSON: May I interpose a question there? Would you please elaborate on the term "filamentous slime bacteria"?

MR. GECKLER: The specific species I do not know. This I have not inspected myself under the microscope.

MR. SAMSON: Thank you.

This bacteria, what do you associate that with? What habitat does it grow in and prosper in?

MR. GECKLER: The specific requirement in relation to nutrient requirements I do not know. We know that carbohydrates and nitrogen are needed. As to what amounts, I am not sure. I will refer this to the bacteriologist.

MR. SAMSON: Thank you.

MR. GECKLER: Bottom organisms were also observed to be few in number. During the October 1963 collections, 13 kinds were found at the Mitchell Diversion Dam and much of the substrate including driftwood, rocks and natural debris was covered with slime bacteria. Only 11 different kinds of bottom organisms were found below the State line at the Henry, Nebraska, bridge and bacterial slime growths were similar to the above station. Fish food production was low. On November 6, 1963, observations were made at the Mitchell Diversion Dam and at the Henry Bridge stations. Observed organisms were covered with filamentous slime bacteria and will probably be eliminated at some later date in the sugar campaign. At the west Scottsbluff, Nebraska, bridge, 18 different kinds of bottom organisms were collected, and those present indicated recovered water quality at this station. Attached algae were observed and appeared to be in a healthy state. Only a limited amount of slime bacteria was observed.

At Minatare, Nebraska, bottom organisms are adversely affected by waste loads from Gering. Only tolerant midge larvae were found and these were few in number. These data may be compared to data from the

Scottsbluff station where 18 different kinds of bottom organisms were found. At Bayard, Nebraska, 15 different kinds of bottom organisms were collected, indicating improved water quality. The numbers of individuals, however, remained few.

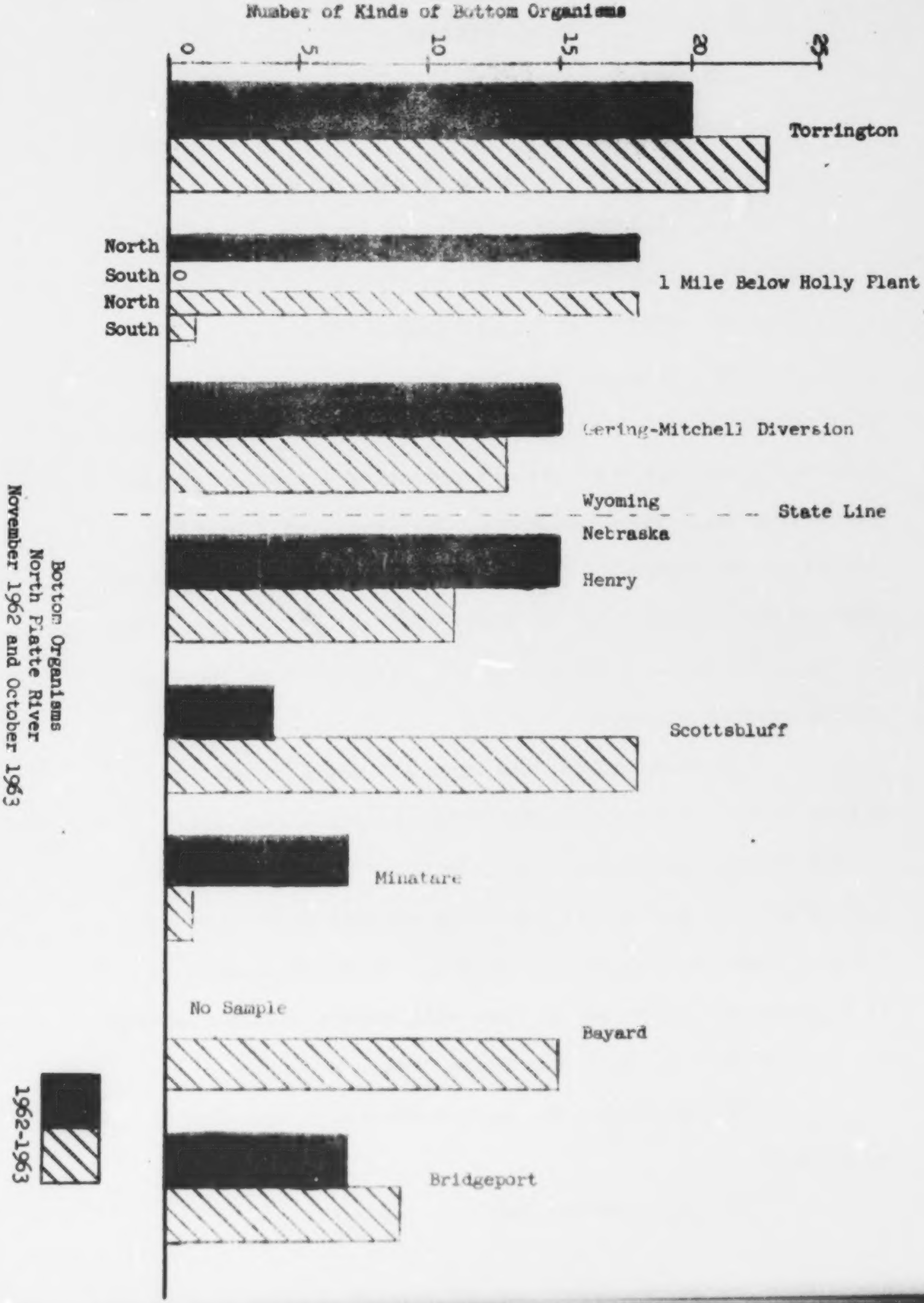
The bottom organisms population at Bridgeport, Nebraska, was much reduced; only 9 different kinds were collected. This reduction in both kinds and population is attributed to waste loads by-passed to the stream from the Bayard Sugar Plant earlier in the campaign. By-passing of sugar plant wastes was observed by biologists on October 17, 1963. The reduced population at this station shows how a waste slug can destroy a portion of the bottom fish food organisms.

SUMMARY AND CONCLUSIONS

1. Waste loads from the Holly Sugar Corporation at Torrington, Wyoming, adversely affected the aquatic habitat making it unsuitable for trout and other game fish from Torrington, Wyoming, downstream to the vicinity of Scottsbluff, Nebraska; prevented the upstream spawning migration of trout; increased water turbidity and silt deposition; stimulated growths of slime bacteria; and reduced fish food production.

2. Industrial and municipal wastes from the Gering, Nebraska, area adversely affected the aquatic habitat making it unsuitable for trout and other game fish from Gering, Nebraska, to the vicinity of Bayard, Nebraska; prevented the upstream spawning migration of trout; increased water turbidity and silt deposition; stimulated growths of slime bacteria; and reduced fish food production.

(The graph attached to Mr. Geckler's statement is as follows:)



Bottom Organisms
North Platte River
November 1962 and October 1963

MR. STEIN: Thank you.

Are there any questions or comments?

DR. SAMPSON: I think we have a couple.

MR. WILLIAMSON: I think we need to tie it down a little more specifically.

MR. STEIN: ^t is all yours.

MR. WILLIAMSON: This matter of turbidity and silt deposition, I think, is open to question. Again, on what facts and figures? We are operating a station at the State line year 'round at Henry, Nebraska, and I have looked at the turbidity figure at the State line since that station was in operation in early 1962. I will defy anybody to look at those results and tell me at what time the sugar plants started operation.

In other words, the natural turbidity of that stream is such that you cannot tell or detect from the normal tests, apparently, when the sugar plant goes into operation. So are we talking about natural silt? Are we talking about specifically silt from the sugar plants? I will grant you there may be some silt several miles upstream, but we are talking about the State line.

MR. GECKLER: You were speaking in relation to deposition?

MR. WILLIAMSON: Yes.

DR. SAMPSON: One question I would like to raise, and we have our game and fish men here. According to one of the studies made by the Wyoming Game and Fish Commission, the game fish of this particular stream are the channel catfish. The trout are on a put-and-take basis. They are planted in the spring and fall.

Cliff, what about that?

MR. STEIN: Just a moment.

DR. SAMPSON: Are we using the trout as a basis for it?

MR. STEIN: Generally we like our men to handle one question at a time. Which question do you want him to handle first?

MR. WILLIAMSON: This would be the first thing, actually, clearing this matter of turbidity and silt deposition, and I am speaking specifically at the State line. I think this is something we want to iron out in our discussion a little later on.

MR. STEIN: Do you want him to answer Dr. Sampson's question?

DR. SAMPSON: No, he wants to iron the other out first.

MR. GECKLER: Granted, we did not measure your respective turbidities, whether they be natural or that attributed to any sugar plant. Visual observation is what I am making on the stream. There is a definite increase of the turbidity of the stream below the Holly Sugar Plant outfall, as compared to upstream, on which I base my opinion. This is strictly observation. No actual physical measurements this year.

MR. STEIN: Do you have any further questions?

MR. WILLIAMSON: In other words, your statement there is that Holly's wastes have prevented the upstream spawning migration of trout. Now, I assume this is based upon the finding of one trout at Scottsbluff bridge, and the lack of trout in the State line area region. I just put out the hypothesis, is the absence of trout in this stream due to a blockage of waste, or is the fact that there never has been any trout in that stretch of the stream or any planted in that stretch of the stream? The put-and-take operation has been brought up here and is about in the upper half mile below the dam at Torrington.

One of the recent studies anyway, which I recall reading, of the migratory habits of planted fish, show they never move much more than a quarter of a mile maximum from where they were planted. So we expect migration of fish as far as the State line from the plants which are made immediately below the dam in Torrington.

Is this based on one thing or is it based on a possibility that there has never been trout in this stretch of the stream, and that this explains part of their absence?

MR. GECKLER: In relation to the trout there are two aspects. The trout in Wyoming has been planted and it is on a put-and-take basis. Even if the trout is put at some distance, a half mile below a different point, it does not necessarily restrict downstream migration through the year. I think you will find that you will get some downstream migration. None was found between the west Scottsbluff bridge until we got to Station 2, which is one mile below the Holly effluent, which is in a section of the stream which is free of turbidity. The effluent had not yet thoroughly mixed. None were recovered in any of the areas where the turbidity is high until we got to the Scottsbluff area, where it had been more evenly distributed throughout the system, and much reduced as compared to 1961, from my personal observation.

MR. STEIN: I just want to ask for some clarification.

MR. GECKLER: I thought there were two points. I answered one. The other one is, the fact that the trout in the McConaughy Reservoir in Nebraska do come upstream. I attribute the one three-and-a-half-pound trout at west

Scottsbluff bridge to this: Not knowing specifically on my part that the avoidance reaction upon the part of the trout to the Gering area wastes would have prevented this trout from coming upstream, but on all spawning migrations we do have early spawners, or at least early migrators, which could very easily have come into this area prior to the campaign and become trapped between two wastes and located themselves in the position below the Holly plant, which is below the west Scottsbluff bridge. This is covered.

MR. STEIN: I wonder if we could look at that map. I think this might aid the questions. Is that the only one we have here? Turn the map so that the Board can see it

As I understand your view, let us assume the absence of a sugar beet mill at Torrington. Could there be trout between Torrington and down to the vicinity of Scottsbluff, Nebraska?

MR. GECKLER: You are asking in relation to the stream affected?

MR. STEIN: Just that stretch of the stream. Could there be trout there? Would trout come up there if there was nothing below?

MR. GECKLER: If there was nothing below, yes.

MR. STEIN: Would the trout come up during the cold weather months?

MR. GECKLER: During the spawning, from October to approximately April.

MR. STEIN: Up to Torrington and above?

MR. GECKLER: Right.

MR. STEIN: What is the name of that reservoir?

MR. GECKLER: McConaughy Reservoir.

MR. STEIN: Assuming there were no plant there and the plants were operating at Gering, Nebraska, could the trout get through from McConaughy?

MR. GECKLER: No, they could not.

MR. STEIN: Let's assume the Gering plant were not there. How far could the trout get up?

MR. GECKLER: Not being a trout, I don't know, but they would probably go upstream to the limit of the water.

MR. STEIN: Let's assume the Torrington plant was in full operation. Stop thinking like a trout.

MR. GECKLER: In the Gering plant?

MR. STEIN: How far would the trout get up?

MR. GECKLER: Based on my findings, I could say to the vicinity of the west Scottsbluff bridge. This was what I base my opinion on.

MR. STEIN: How far is that below the State line?

MR. GECKLER: Approximately twenty miles.

MR. STEIN: I just raise this for the purposes of your question.

MR. WILLIAMSON: One other clarification on the bottom organisms above Torrington. The State line is what we are interested in, and I would say your results as you had them there, 23 versus 18 --

MR. GECKLER: Twenty-three to eleven at the State line.

MR. WILLIAMSON: In the previous year it was 20 versus 15 in the same stretch. I was wondering how much variation is really significant. Is it just a 25 percent variation that we are talking about here?

MR. GECKLER: Joe's work was done in November. Mine was done in October. I would assume from looking at the stations, both of these same stations, two weeks after my collections in November it appeared to me that the reduction went even further than this, though no samples were taken. The reason I say this is that the organisms observed at this time to me were fewer than in October, and those that I did observe were loaded or covered with the slime bacterial growth. There was no question in my mind but what I feel that there would be a far greater loss within the next month or so, during the campaign, in relation to the actual decrease in the number of different forms. This is October until some future date in the campaign.

MR. WILLIAMSON: So actually your study indicates worse conditions this year than there were a year ago, if you consider the same period of time.

MR. GECKLER: Based on my data, yes.

MR. STEIN: Before we get into the question, see if I am correct in these assumptions, Mr. Geckler. As I understand it, the unfortunate coincidence is that the water has to get cold before the trout come up to spawn.

MR. GECKLER: That is what triggers the spawning.

MR. STEIN: The cold water in this section of the North Platte River coincides with the sugar beet campaign and throughout this presents the difficulty, as I see it. Again, I just want to get this clarified.

Now, during that time when this starts, in October, presumably, or about that time, generally speaking from your knowledge of the area, what happens to silt from irrigation return flow? Does that decrease?

MR. GECKLER: My observation during October in the drainage ditches -- well, the ones that I observed -- was from Henry downstream, and I found there was a high turbidity coming from the drainage ditches. There was high turbidity that I observed in October from Henry down.

These are the ones that I could see from the road. These are the ones that crossed the road to the river. Turbidities were exceedingly high in these. This is why I cannot separate that attributed to sugar beet operations and that of irrigation return.

MR. STEIN: Here is the question I am getting at. I asked before, in the absence of both these plants you said that the trout would come up. You don't think there is enough turbidity in these drainage ditches to keep them out, or do you?

MR. GECKLER: Turbidity, as I used it, is an evasive word. I should have used "waste loads." All I can say is what I observed. The visual observation was of turbidity and that is why I put it in the report as such.

MR. STEIN: You are still of the opinion that in the absence of the sugar beet plant, on the present type of operation at Torrington and at Gering, that the trout could come up from the reservoirs as far as trout would normally go, and spawn in this area?

MR. GECKLER: That's right.

MR. STEIN: And this would be a trout stream. Let me withdraw the last one. We have been here before and we have had some indications that due to the shifting sands, that this might not be appropriate for a trout stream, in any event. Have you given any thought to that?

MR. GECKLER: Yes, I have.

MR. STEIN: What is your conclusion on that?

MR. GECKLER: I have two thoughts. One, I have located personally at every station above and including the West Scottsbluff bridge station, gravel areas, at every station up to the Torrington area, which is four stations below. There are gravel areas here. These have the potential for spawning. This probably would not be the major spawning area. It would be the small feeder tributary streams on upstream which would be the major areas for natural spawning.

DR. SAMPSON: What I am trying to ask is this: Is it fair to use the trout as the only fish which determines whether or not that is a pure stretch of water, when according to our people it may be the native fish that were in there were a different species.

MR. GECKLER: In my recommendation I made a statement in relation to warm water game sports fisheries in the area which would augment a winter trout sports fishery. This potentialwas there providing waste loads to the stream were not detrimental to the propagation of those species.

DR. SAMPSON: In other words, you don't use trout as the only fish that was used in this stretch of the river for pollution indicators?

MR. GECKLER: No, I don't.

MR. SAMSON: I wanted to elaborate on one of Art's questions. On this silt deposition -- and you stated that you made some personal observations about the outfall of the so-called flume water at Holly -- have you made some of those observations just recently in the last few days or last few weeks?

MR. GECKLER: The last time I was in that area was November 5 of this year.

MR. SAMSON: Of this year?

MR. GECKLER: Of this year.

MR. SAMSON: You made some remark about it that you noticed some differences in the characteristics of the flume water and stream as it came down over that little fall there. I would like to have you go into some detail on what you observed in that connection.

MR. GECKLER: What fall are you speaking of?

MR. SAMSON: Holly at Torrington.

MR. GECKLER: I believe this is above the outfall Is that above the outfall? The difference between the two?

MR. SAMSON: The flume water and the streams.

MR. GECKLER: As I said before, the water upstream was quite clear at the control station, exceedingly clear. At the cross-section where the Holly effluent emptied in, where it empties into the river we had gross turbidity on the effluent side. There was clear water on the other side. This year it persisted one mile or a little farther downstream where you could actually visualize the differences, the turbid area encompassing approximately 50 percent of the width of the stream, clear water in the other 50 percent.

MR. SAMSON: Did you observe any beet toppings or beet tailings in that effluent?

MR. GECKLER: I observed fine beet tops and fine beet particles, yes.

MR. SAMSON: Did you observe any foaming?

MR. GECKLER: Yes, there was foaming at the effluent.

MR. SAMSON: What about the odor?

MR. GECKLER: Yes, there was an odor.

MR. SAMSON: What type of odor? Can you describe that?

MR. GECKLER: Not a pleasing odor, if I may say this.

MR. SAMSON: I have nothing further.

MR. STEIN: Is that characteristic odor generally associated with sugar beet operations?

MR. GECKLER: As far as I know, sugar beet effluent waste.

MR. STEIN: Are there any others who would like to ask any questions?

MR. WILLIAMSON: One additional comment. We have got to sort this thing out at the State line, not two miles downstream from the plant. I will give you two or three miles of that stream in which there is a discoloration. After Cherry Creek and Katzer Drain I say that you cannot separate or even detect the additional turbidity at the State line.

MR. SAMSON: Can you state this upon reasonable biological certainty whether or not the effluent coming into the Platte River, at the outfall at Torrington -- and I am referring to the Holly outfall -- affects the quality of the water at the State line?

MR. GECKLER: Yes, sir. This is my statement.

MR. STEIN: This is his conclusion. Let me give you this, and I want to do this now.

MR. SAMSON: He said based upon reasonable biological certainty.

MR. STEIN: This is what his assertion is. I would like to state this now from the point of view of the Federal operation so we don't just get this as a conclusion, because we are going to repeat it again.

As far as I can see, this is the essence of the operation.

Doctor, I will agree with you that trout may not be the sole criterion of what you want to do with the water. The question here is, though, that someone makes a determination of what they want to do with water, and sometimes you don't take the water the way it is natural, but you might add some fluorides to it. But if that is the determination that a State wants to make for the use of its water resources I think it is our job in the Federal establishment, in dealing with water pollution, to carry that out.

Now, here is the situation, as I see Mr. Geckler's operation. He believes that the discharges from the Torrington mill inhibit about 20 miles of stream in Nebraska from being used as a trout and sports water fishery. He also indicates that the cleaning up of that in a sense might be relatively futile, unless Gering and below were cleaned up so the fish could migrate from the McConaughy Reservoir. Nebraska thinks this should be used as a trout and sports stream fishery. If they get that cleaned up, then I think from the Federal point of view -- and I might say if they want to use this as a trout and sports stream fishery and they want to use this for trout spawning, I would say from the Federal point of view that we will arrive or at least present to you the proposition that Wyoming should at least present Nebraska with as clean a water as Nebraska is creating itself, not any cleaner or any dirtier. But if Nebraska has cleaned it out to the extent that they believe it can be used as a trout fishery and sports fishery, and assuming Mr. Geckler is right, then I think we would ask the Wyoming people to consider the same thing.

Again, I would like to say or make one point here, that this goes beyond just Nebraska saying this. This means Nebraska taking action to assure that this is done.

DR. SAMPSON: What we are talking about -- and we have been beating around a bit -- is the fact that where does Cherry Creek enter. We have two streams there that enter in that produce sediment too. I think that as far as I am concerned I don't doubt your ability or your integrity, but I am not satisfied that all things have been taken into consideration.

The point that I am getting at -- and I think maybe this is a place we might very briefly state our point -- the status of the waters that leave the State of Wyoming is the only thing, as far as I am concerned, that is in question at this hearing. I don't give a hoot what the water is like in Gering, because I think that this is Earl Rogers' business down there.

When the water leaves the State of Wyoming and is of the proper quality, as you mention it, it is the kind that Nebraska uses for themselves, and then I think that this is the point at which the decisions must be made. I think these other things are very interesting information but what is happening at the Great Western Sugar Company at Scottsbluff in this reach of water is basically none of Wyoming's business.

MR. STEIN: I don't think that question is directed to him. I think we are not very far apart here.

DR. SAMPSON: I think we ought to know what we are talking about.

MR. STEIN: I agree with you. We are only interested in the water as it goes across the line and what it does in Nebraska. However, in any State, particularly in dealing with a stream such as we have here, which doesn't form a border between two States, but goes from one State to the other, we, in effect use the equity doctrine of clean hands. In other words, we cannot ask a downstream State to ask for clean water coming over its boundaries when as soon as it gets over the boundary they are going to foul this up and degrade it. There is no point in putting the upstream State to that expense and regulatory program.

Now, we are solely looking at what is happening in Nebraska from the point of view to determine from Nebraska's reasonable use, what they have a right to expect under our law of water coming across the State line. This is the only reason we are looking at it. I think you people have gotten along very well. We have had other States that have demanded real clean water coming across their State line and didn't move four or five miles before they made it worse than it was before. Obviously, we can't put the force of the Federal law and Federal authority behind such a proposition. That is why we are looking at what happens in Nebraska, and this is what I had reference to.

Are there any more comments on this?

DR. SAMPSON: I would like to ask Mr. Bosley from our Game and Fish Department if he has any comments, or wants to reserve an opinion, or anything, at this time.

MR. BOSLEY: I would just as soon wait until we present our part of the program. Incidentally, as long as I am up, I would like to introduce Mr. Fred Eiserman, who is the Supervisor of Fishery Management and Research.

I would also like to introduce Mr. Larry Peterson and Ralph Hudelson, who are the District Fishery Biologists for this section of the Platte River.

DR. SAMPSON: I would also like to introduce Mr. Scott, the attorney for the Holly Sugar Corporation.

MR. BORTHWICK: The organisms which you mentioned in your report, are they significant from a general health standpoint, or do they pertain only to the fact that fish can't migrate upstream because of the existence of those organisms?

MR. SAMSON: I might suggest that Mr. Clark is here from the Taft Center, who is an authority on the questions you are propounding and he can answer them for you.

MR. STEIN: I think this is beyond his area of competence. We are putting the man on next who will cover that.

DR. SAMPSON: Maybe there will be a little clarification.

MR. WILLIAMSON: Maybe you are confusing bottom organisms which he is speaking of here, which is merely the insect larvae and this type of thing which is fish food, and in no way related to a health problem, as compared to bacteria, which may be a health problem.

DR. ROGERS: There was also a reference to some bacteria, and as I understand it, these are only important as they affect this food chain and not as they affect human health.

MR. STEIN: That's correct.

MR. JENSEN: I am Lloyd Jensen of Great Western Sugar.

Can trout tolerate sewage? If the factory were shut down the trout would swim up through the raw sewage? Is that right?

MR. GECKLER: I refer, I believe, to the Gering area in my conclusion.

MR. JENSEN: I thought in one statement he was talking about the Gering factory.

MR. STEIN: He meant the whole complex. By the way, we have been asked to recess and we will for about ten minutes now. I want everyone to think about this because this has come up peripherally. The next view will be on the bacteriological operation.

Now, it seems to me that when we get into this, when we talk about bacteriological increases because of sugar mill operations, it behooves us to think of municipal wastes, or the relationship to municipal wastes. If I am wrong I would like to hear about it, but up to this point

I have always thought that municipalities or perhaps slaughterhouses were possibly great sources of bacteriological wastes of the kind which affect water uses. I would suggest we may think about that.

Could we stand recessed for ten minutes?

(Whereupon a recess was had.)

MR. STEIN: May we reconvene?

MR. CLARE: We have one report by Mr. Harold Clark of the Public Health Service, Cincinnati, Ohio.

Mr. Clark.

STATEMENT OF HAROLD F. CLARK, UNITED
STATES DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE, PUBLIC HEALTH SERVICE,
ROBERT A. TAFT SANITARY ENGINEERING
CENTER, CINCINNATI, OHIO

MR. CLARK: Mr. Chairman, conferees: I would like at this time to present an analysis of bacteriological data made by the Public Health Service between North Platte River Mile 208.8 and North Platte River Mile 141.8, during the week of October 14 to 21.

This study was made using the average fecal coliform group density as measured by the five tube-three dilution method. I add that for those of you who want to calculate these data. This was at North Platte River Mile 208.8, Station 1, and the background count for fecal coliform was 88 coliforms per 100 milliliters. At North Platte River Mile 199.0, which is Station 2 in your report, at the Henry Bridge, the density had increased to 15,000 fecal coliform for each 100 milliliters, followed by a decrease to 3,300 and 1,400 respectively at North Platte River Mile 184.0, which is Station 5 at the Mitchell Bridge, and North Platte River Mile 177.3, which is Station 7 at

Scottsbluff at the 20th Street Bridge. Between North Platte River Mile 177.3 and North Platte River Mile 160.2, which is Station 10, or the McGrew Bridge, there was an increase in the density of 24,600 at North Platte River Mile 160.2, and a further increase to 89,400 at North Platte River Mile 150.6, which is Station 11, or the Bayard Bridge, representing the highest average density of the fecal coliform group in the North Platte River between North Platte River Mile 208.3 and North Platte River Mile 141.8.

At North Platte River Mile 141.8, which is Station 14, the density for the fecal coliform group was reduced to 20,000.

Comparison of the average fecal coliform group densities per 100 milliliters for 1963 with 1962 demonstrates a considerable reduction at Stations 2, 5, 7, 10 and 14, a slight increase at Station 1, which is insignificant, 30 to 88, and a considerable increase at Station 11, which approximated in 1963 the density of Station 7 in 1962. I present those comments in order for you to make a comparison of last year's conference data with the current conference data being presented.

MR. SAMSON: Mr. Chairman, let us pause for a moment at your last remark at Station 11. Do you have a conclusion as to the increase -- the reason for the increase in the fecal coliform at Station 11?

MR. CLARK: No, sir, I have no conclusions as to why, except my only interpretation would be that more fecal pollution was appearing at that station and perhaps the flow rate might have been greater. I don't know. That is purely guesswork.

MR. SAMSON: What is the general nature of the environment at Station 11? What is the nature of the topography? Are there houses or are there any towns in there, or what is the general characteristic of that area?

MR. CLARK: That is just above the entrance of Bayard, between McGrew and Bayard. It wouldn't be coming in right at that station. It came in somewhere between those two stations. I think I may clarify that question later. If I don't, please ask it again.

MR. SAMSON: Thank you.

MR. CLARK: Densities for the total coliform group were markedly higher than the fecal coliform group, but would yield the same interpretations. I won't take up the time of this conference to analyze the total coliform at present, only fecal coliform.

An investigation of the coliform and fecal coliform groups in the wastes from sugar processing was made in cooperation with the Holly Sugar Plant at Torrington. This study demonstrated that the coliform bacteria from this plant were contained in the soil adhering to the beets or from floor washings, etc., removed during the washing process to be returned to the river as soil particles and bacterial pollution. The average fecal coliform density in the flume water which reached the North Platte River by the Torrington, Wyoming, Bridge, we find was 1.1 million per 100 milliliters, which was approximately twice the density of the fecal coliform group in flume waters collected at the screen.

The ratios of total coliform to fecal coliform groups were 0.025 at the screen and 0.021 in the flume water entering the North Platte River. This increase in the flume water at this point entering the river over that of samples taken at the screens could be due to growth in the flume water or better distribution of the coliform bacteria through mixing, or both.

I haven't the data at this time to say what the causes are, but those are the possibilities.

A further comparison of the fecal coliform group in the North Platte River can be made on the basis of average density of the fecal coliform group contributed per second. For the interpretation of this group I would like to say that I have presented the data of fecal coliforms in terms of densities per 100 milliliters, which is the customary way of reporting this group. However, that measures the average hazard occurring in this stretch of the stream due to fecal organisms. If we want to measure the proportion of the bacteria and sources of both we have to take into consideration other factors, and I have taken the fecal coliform bacterial density per second at the sample point in order to get some idea to prorate where these bacteria were present, how many were present at each time, and these figures are comparative from sample point to sample point.

If any of you are interested in the formula, it is MPN per 100 milliliters times 283.2 times cubic feet per second, and this will give you the total coliform per second in the area. When the figures were calculated, I referred to my original data, so there is no error.

This comparison takes into consideration the fecal coliform density in the total flow of the river and corrects it for the dilution. Average flow values were taken from Table II, Stream Flow in CFS, and average fecal coliform densities from the samples examined during October 14 to 19, 1963. The North Platte River at North Platte River Mile 208.8, which is Station 1, would contribute 7.94

million fecal coliforms. The flume water at Torrington Bridge, 2295.25 million.

On a percentage basis, 99.3 percent of the fecal coliform contribution could be attributed to flume water. At North Platte River Mile 199, which is Station 2, or the Henry Bridge, the fecal coliform density per second was 1550.52 million, which can be considered interstate pollution but represents a decrease from the estimated total at Torrington, Wyoming, of 744.73 million, or 32-plus percent decrease.

At North Platte River Mile 184, which is Mitchell, and North Platte River Mile 177.3, Scottsbluff, the fecal coliform densities per second were 643.9 million and 342.16 million respectively. There was a steady decrease in the fecal coliform group between the Torrington Bridge estimated to be approximately a reduction of 85 percent.

At McGrew Station the fecal coliform increased to 7266.3 million and increased further downstream at Bayard to 26,712 million.

The last sample point in the reach of the river studied was at Bridgeport, with 8643.2 million.

I have thrown a lot of figures around here and I would like to briefly summarize it with the Chairman's permission.

In summary:

1. The North Platte River above Torrington, Wyoming, had a fecal coliform density per second of 7.94 million.

2. Below the Torrington Bridge, the calculated fecal coliform density was 2295 million, with 99.3 percent being contributed by the effluent of the Holly Sugar Company.

3. The fecal coliform group progressively decreased at each sample point to and including North Platte River Mile 177.3 sample station.

4. Between North Platte River Mile 177.3 and North Platte River Mile 154.6, the fecal coliform group reached a maximum value of 26,712 million for the highest value in the reach of the stream under investigation.

5. The final sampling station at North Platte River Mile 141.8 had 8,643 million for the second highest density in the area under investigation.

That concludes my bacteriological summary.

MR. STEIN: Are there any comments or questions?

MR. WILLIAMSON: I didn't catch the original figure. Did you say there was a doubling of the number from the fine screen house to the effluent point?

MR. CLARK: Yes, sir.

MR. WILLIAMSON: On the fecal coli?

MR. CLARK: The fecal coliform density at the point where the screen was carried, which wasn't an ideal sampling point, I will admit, but it was the only point we had access to, was .55 million. At the effluent, before it entered the North Platte River, far enough up the effluent, the average density of fecal coliform was 1.1 million. That is approximately it.

MR. WILLIAMSON: Was there any comparable increase throughout the flume line?

MR. CLARK: We couldn't sample the flume line any other place. However, there are other people here who can probably give you a better answer than I can. But just on a rough judgment, I would judge from 10 to 15 minutes flow time, between those points.

Would that be a pretty fair estimate? I would say the increase is probably due to better distribution, because at the screen there you have a rotary screen and they sample out the coarse particles and you have a lot of adhering organisms through adsorption, as those go down the flume, and they probably would get a good mixing and you get a better suspension. According to our way of measuring, whether you have five organisms in a clump, ten in a clump, or a single organism, they all come out as one organism by any technical measures we have to make.

MR. STEIN: Are there any other questions or comments?

MR. SAMSON: No questions.

DR. ROGERS: I have nothing.

MR. SAMSON: I thought we might clear one thing up. What is the fecal coliform symbolic of?

MR. CLARK: The fecal coliform -- and I am not being facetious when I give you this definition -- fecal coliform are defined as a coliform bacteria expelled from the guts of warmblooded animals. They are identified by the production of gas from lactose in a suitable medium at 44.5 degrees Centigrade plus or minus 0.5 in 24 hours. The non-fecal coliforms are those we classify as having an unknown source.

At Geneva, Switzerland, this fall our definition as defined was adopted as the official WHO definition for the fecal coliform group in all of the World Health Organization studies, and last Thursday it was also adopted as the official definition to be included in the 1965 definition of standard methods for the examination of water and waste products for all waters that have undergone no degree of treatment whatever.

MR. SAMSON: Thank you very much.

MR. CLARK: The fecal coliform may be associated with your enteric bacteria, enteric pathogenic entities, Salmonella, Shigella, Brucella, and in some cases the microbacterial group, and various types of viruses that may be present in fecal excreta, and also they may be associated with the presence of parasites of various kinds. Therefore, we have to consider that where a fecal coliform organism is present, we have a hazard because of the possibility that exists that sooner or later this water comes in contact with susceptible animals and disease will occur. It may not be today, but it may be tomorrow. Sooner or later, if the practice is continued, disease will result.

MR. SAMSON: Mr. Clark, do you have a conclusion based upon reasonable bacteriological certainty as to whether or not the coliforms which you testified to, you found at Station No. 2, had any connection with the coliforms you found at the flume water outfall at Holly Sugar Corporation; and if you have, would you state what that conclusion is?

MR. CLARK: I am assuming that is the flow time between the Holly Sugar Company and its Station No. 2 at the State line that you are asking about?

MR. SAMSON: That is right.

MR. CLARK: It is a reasonably short time. I do not have the flowing CFS in miles per hour. It is not very far -- eight or nine miles -- so it shouldn't be very long -- three miles an hour, three or four hours. If that is so, I would further suggest with the death rate of the background organisms of fecal coliforms above Holly -- that those coming from the Cherry Creek, and so forth, are the same as those in the flume water wastes. Therefore, I would assume that 99 percent -- the 99 percent figure at Henry would be attributed to the flume water, and that 1 percent would be attributed roughly to the Cherry Creek.

DR. SAMPSON: Did you make a study on streptococcus faecalis along with these, any of the pathogenic organisms?

MR. CLARK: There was no study made on any of the pathogenic organisms. There were some colonies collected on the fecal streptococcus group, nonpathogenic, that is, and they were sent to my laboratory and I identified them in Cincinnati. In most all the sample points except in a couple of irrigation return ditches they were chiefly those that belonged to the typical streptococcal faecalis varieties zymogenes and liquefaciens, and streptococcus durans.

At two stations we found a large number of the streptococcus group, and in my experience those are only characteristic of the domestic animal wastes and are not characteristic of the human wastes. So I would attribute those perhaps to feedlot operations that might occur in those areas.

DR. SAMPSON: I have no further questions.

MR. CLARK: I think somebody had a question on the public health significance of the nuisance organisms.

MR. STEIN: All right.

MR. CLARK: The question was asked about the significance of the slime-producing organisms. The slime-producing organisms which we call the nuisance organisms. They get that name because they are a terrific nuisance producer to various water users, but they have no known pathological or epidemiological significance. They are not known to be found with or associated with an environment in which pathogens grow. So, therefore, they have no public health significance.

Our public health significance is based upon the theory of condemnation by association. We find an organism that is associated constantly with the feces of warmblooded animals, and it might be associated with pathogens at any time. We use that condemnation by association for public health significance. The slime-producing organisms have no such significance or association that is known.

MR. STEIN: For purposes of clarification, I know you used the word "nuisance" as a word of art. But we have a lot of these fish and wildlife and conservation people here. I think when they deal with slime-producing organisms they get on fish food and break the chain of an environment, so you don't have fish, and they would consider that more than a nuisance, and consider that a damage.

I recognize that from the point of view of the field that you are working in, that if something does not have or is not something that is pathogenic or doesn't have a health effect, it is classified as a nuisance, but this is your point of view, and not necessarily the point of view of another discipline.

MR. CLARK: Strictly from a public health point of view, Mr. Chairman.

MR. SAMSON: I believe Dr. Sampson's attorney is here and has some questions that he was asking the biologist here.

MR. BORTHWICK: He just answered that question.

MR. STEIN: If there are no further questions, thank you very much, Mr. Clark.

MR. CLARE: Mr. Chairman, we have two Federal representatives here who indicated that they would make statements.

I would like to introduce Mr. Albert Konselman, who is with the Bureau of Mines, Department of the Interior, Denver.

Mr. Konselman.

STATEMENT OF ALBERT S. KONSELMAN, DEPARTMENT OF THE INTERIOR, BUREAU OF MINES, DENVER FEDERAL CENTER, DENVER, COLORADO

MR. KONSELMAN: My remarks will be very brief. The Bureau of Mines, of course, isn't directly interested, certainly, in the type of pollution that has been discussed this morning. We are interested in pollution by the mineral industries, and I am rather gratified to see that their conduct hasn't been held up as any bad example.

The Bureau of Mines does make water studies, but it studies the use of water by mineral industries rather than the effluent or disposal of water. Outside of that, I really have nothing to say, except to thank you for having invited us, and we are very interested in these proceedings.

Thank you.

MR. CLARE: Thank you, Mr. Konselman. We are glad to have you with us.

Representing Mr. Mosbaugh of the Department of the Interior Field Committee, and also the Bureau of Reclamation, is Mr. Sensintaffar, who is project manager for the North Platte River project office, Casper.

Mr. Sensintaffar.

STATEMENT OF R. M. SENSINTAFFAR, PROJECT MANAGER, NORTH PLATTE RIVER PROJECTS, BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR, CASPER, WYOMING

MR. SENSINTAFFAR: Mr. Chairman, members of the Council, ladies and gentlemen:

I am going to digress a little bit, if it is satisfactory, and go a little higher on the river for a few statements of benefit.

MR. STEIN: Just put in what you think is appropriate.

MR. SENSINTAFFAR: I had the pleasure of attending your first session on the pollution abatement on the North Platte River held in this city on September 12, 1961, and am very glad to attend this third session.

We of the Bureau of Reclamation are ever mindful of the need for the elimination of pollution from our river waters, which are becoming more valuable with each day. Of particular concern to the Bureau of Reclamation on today's discussion on pollution abatement is our operation of the North Platte River in Wyoming and western Nebraska, and the operation of our facilities at our eight dams, six power plants, numerous substations, and seven camps.

Before the turn of the century, the North Platte River is reported to have been a clear and pure stream all the way from its headwaters in Colorado to its juncture with the South Platte River at North Platte, Nebraska. Then not many people lived along the river to make use of this pure water. It has been reported that trout and pike inhabited the river through most of the river reach. Many wagon trains traveled the Oregon and other trails and secured their domestic water from the North Platte River.

Today better than 110,000 people live adjacent to and use the water out of the North Platte River for municipal, industrial and agricultural purposes. If you will add to this the people who travel to this river for recreational purposes, the above figure would probably be doubled.

To discuss the river operation, I am assuming most people here today have a rough idea of the geography of the river. The Bureau of Reclamation's principal interest is its operation to supply storage water to irrigate 380,000 acres of productive land, and for other uses.

To explain this briefly, I want to refer to three separate portions of the river as follows: First, the portion from the Alcova-Pathfinder-Seminoe storage reservoir area southwest to Casper to the headwaters in Colorado, a distance of about 200 river miles.

Second, the portion between Alcova and Guernsey storage reservoirs, a distance of about 180 river miles.

Third, the portion between Guernsey and Kingsley storage reservoirs, a distance of about 140 river miles. Scottsbluff, where we are meeting today, is the heart of this area.

The upper reach of the river from the Alcova-Pathfinder-Seminoe reservoir area to the headwaters is relatively free of pollution, except for some sediment which is inherent with the runoff at any river.

In the middle reach after the completion of the Pathfinder storage reservoir in 1909, very little water was released during the winter months. With the construction of refineries, industries, and homes in the Casper, Glenrock and Douglas areas after about 1950, the North Platte River from Casper to Guernsey became somewhat polluted with sewage and industrial waste, especially during the winter months.

With the completion of the Glendo storage reservoir near Glendo, Wyoming, in 1957, and the Gray Reef regulatory reservoir in 1961, a new operating plan was established between Alcova and Glendo. This permitted the release of water from Alcova Reservoir on a more uniform basis throughout the year.

Concurrent with this, all the cities along the river installed disposal facilities and the refineries in the Casper area removed the industrial waste from the river. I am advised that the expenditure of money for the disposal facilities and the industrial waste removal amounted to nearly five million dollars in the Casper area alone.

In our studies and justification for the Gray Reef reservoir we worked closely with the Wyoming Pollution Control Board, the United States Public Health Service, and others, and especially Mr. A. E. Williamson, head of the Wyoming Environmental Sanitation Department.

The quantity of water needed for pollution abatement between Alcova and Glendo was one of the prime considerations in our studies.

With the installation of these pollution abatement facilities, the North Platte River between the Alcova area and Guernsey has become relatively free of pollution from sewage and industrial waste. The Wyoming Game and Fish Commission has restocked this reach of the river with some success. During the past few years there has been a noticeable difference in the turbidity of the water in the North Platte River between Alcova and Glendo from algae and tributary sediment. This condition, especially noticeable after rainstorms in the Casper-Alcova area, is giving the recreational interests some concern and is presenting a problem for the refineries in the Casper area. This is a matter that is being given some attention as to what is the source of this changed turbidity.

In the lower reach of the river between Guernsey and Kingsley reservoirs, the operation of the river is somewhat involved. Nearly 450,000 acres in 45 irrigation districts are irrigated in this river reach. The Bureau supplies storage water to about 360,000 acres of these lands. This is the area of the great valley where we are meeting today.

Irrigation water releases at Guernsey Dam are relatively large during the irrigation season. Most of this water is diverted between Whalen Dam and the Wyoming-Nebraska State line. During the non-irrigation season very little water is released at Guernsey, but the return flow water of the irrigated lands provides ample water for the river supply.

In the reach of the river from Torrington, Wyoming, to Broadwater, Nebraska, which has been the subject of analyses in the previous two conferences, we in Reclamation are concerned with the stream pollution problem to the extent that the quality of the water must be suitable for irrigation purposes. The quality of the return flow water from subsurface seepage may be of concern to some people. Many of the irrigation districts in this valley are lining canals and laterals to conserve irrigation water supplies better and to reduce the seepage of lands. This also reduces the quantity of return flow water. I am sure it is of interest to this group to know that in recent years 52 miles of main canal and laterals have been lined, 133 miles of laterals have been placed underground, and 768 miles of farm laterals have been concrete lined. Many more miles are in the offing.

To reduce this seepage further, several of our irrigation districts have asked that we lower Guernsey Reservoir each year for a short period to flush out some of the silt deposits. This silt is suspended and carried in the irrigation water supply to assist in sealing the canal and lateral banks. This has been a successful operation.

A number of industries have moved into Wyoming in the past few years. Many of the existing industries have

R. M. Sensintaffar

expanded. The Natural Resource Board of Wyoming has been quite concerned about the availability of municipal and industrial water on the North Platte River and elsewhere in Wyoming. We are making a preliminary study on the need for municipal and industrial water and the means of providing this water. The quantity of the water in the river from the standpoint of industrial use will be given consideratio in this study inasmuch as any industry is quite interested in the quality of the water, as well as the quantity.

With reference to Bureau of Reclamation structures, in the last few years we have examined all sanitation facilities at our dams, power plants, substations and camps. We have made or are in the process of making several modifications.

At the Guernsey camp, the septic tank was completely rebuilt. We are in the process at the Seminole camp of rebuilding this septic tank. At our pilot Butte power plant, which has formerly dumped raw sewage into the tailrace, a modern septic tank has been installed. This plant is located in the Wind River drainage rather than the North Platte River.

At our Lovell and Sidney substations we are now in the process of putting in modern sanitation facilities with flush-type toilets and septic tanks.

At our Cheyenne substation we are considering the abandonment of our present septic tank and connecting thereto the city sewer system, which has recently been extended to near our substation area.

With the changes I have outlined, the operation of the Bureau of Reclamation sanitary facilities at our installations will be adequate and will not cause any pollution of the North Platte River.

Thank you very much for permitting me to make this brief statement for the Bureau of Reclamation relative to our interests in pollution abatement on the North Platte River. I believe this statement relates our current interest in today's discussion.

MR. STEIN: Thank you very much.

Are there any questions or comments?

MR. SCOTT: I am Elmer Scott, attorney for the Holly Sugar Corporation.

Could you tell us the amount of fluctuation in the flow of the river as it reaches Torrington? I think that would have a bearing on the concentration of the pollution in the stream at the various seasons of the year.

MR. SENSINTAFFAR: Yes. Let's take the summertime, when we are irrigating and we release about 5,000 second feet from Guernsey. That is at maximum irrigation.

Then, when you get down to Torrington, I can't give you that exact figure, but it would be around 1,000 second feet When you get down to the State line we zero it out because of the Supreme Court decree, and we do not release any water beyond the State line.

In the wintertime almost the reverse is true. We start out with zero at Guernsey and all the return flow comes in, and when we get to the State line I can't give you a really good figure on it, but I would judge from 300 to 500 second feet is what it is at the State line now. So the quantity of water from Guernsey coming down past Torrington is not very large at any time, because the inter-state canal is on the north side and the Fort Laramie canal on the south side takes out two-thirds of the water.

MR. STEIN: Again, I don't want to anticipate, but we do have flow studies. When Mr. Townley comes up again we might have this. The significant point here is this -- and if I am mistaken, please let me know: Is the water that comes to the point there in your campaign the crucial point? Isn't that correct? What they are interested in is the water that flows in the river from, say, about October through January. That isn't your irrigation season, is it? I think Mr. Townley may very well have these figures.

MR. SENSINTAFFAR: Mr. Murphy, the State of Wyoming's representative at Torrington, would have all those figures.

MR. STEIN: Right. Thank you very much.

Mr. Clare?

MR. CLARE: Thank you. We were glad to have you with us again.

I wonder if we could ask Don Townley to summarize the presentation of the Federal agencies.

MR. STEIN: Mr. Townley, before you do that, do you have the figures in mind? I wonder if you would just refer to them?

FURTHER STATEMENT OF DONALD A. TOWNLEY, CHIEF, ENFORCEMENT SECTION, UNITED STATES PUBLIC HEALTH SERVICE, REGION VI, KANSAS CITY, MISSOURI

MR. TOWNLEY: The average flow for a six-day period is 319 CFS, with a high in this period of 368, and a low of about 292 cubic feet per second.

MR. STEIN: That isn't too much of a fluctuation

MR. TOWNLEY: Mr. Murphy says this is the most regulated stream in the world, and he can predict within a foot or two what is going to be the river at any point within the stream, and I believe he can do it.

MR. STEIN: I hadn't heard these figures before, but in my opinion, on the basis of my experience in hearing these, this is about as small a fluctuation as I have run into from the average.

Would you go ahead?

MR. SAMSON: Before you get into the summary, I have a couple of questions.

Last year, wasn't part of this survey carried on with the help and assistance of the laboratories at Great Western Sugar Company? Didn't they make some tests and surveys in connection with B.O.D.'s, and so forth?

MR. TOWNLEY: The Great Western provided means for measuring flows at all of their effluent and outfall lines, but the data we have in the report is the data we collected.

MR. SAMSON: My question is, was the information that you received from them correlated with the information that you had gotten together yourself?

MR. TOWNLEY: I haven't seen their information, Mr. Samson.

MR. SAMSON: You haven't seen it?

MR. TOWNLEY: No.

MR. SAMSON: You mean it was never turned into Kansas City?

MR. TOWNLEY: We didn't get the information.

MR. SAMSON: Then none of that information ever became available to you, and consequently was never correlated with your work and your investigation?

MR. TOWNLEY: The only data that I used is what we have collected.

MR. SAMSON: I didn't know that. I don't know that there is any significance to it, but I do know that they made their facilities available, and I thought worked with your crews hand in hand on the survey that was made.

MR. TOWNLEY: As I said, they provided the measurement at all of the points we wanted to measure, which is no small matter.

MR. SAMSON: I have another question. The other question is: On your investigation below Gering, did you, in your investigation correlate or differentiate between the Great Western outfall at Gering and the outfall which is immediate adjacent thereto upstream? And I think that comes from -- it carries the waste waters from the packing industry and probably from the entire City of Gering. I am not too sure about that, but there is a tube upstream from the Great Western outfall.

Did you in your investigation differentiate between the differences in the quality of the effluent at those two points?

MR. TOWNLEY: I think the pick-up here between Station 7, which is Scottsbluff, the 20th Street Bridge, and Station 10, which is McGrew Station, downstream, some 10 or 15 miles -- the pick-up in the fecal coliform here does show the effect of untreated waste going in there in this general area.

MR. SAMSON: My point is, did you make any testings immediately below the outfall which is about 200 or 300 feet upstream from the Great Western outfall?

MR. TOWNLEY: No, we didn't.

MR. SAMSON: You didn't do any sampling between those two areas and immediately below?

MR. TOWNLEY: No, we were interested primarily in the condition of the overall river, and not any particular outfall line.

MR. SAMSON: Do you know whether or not the results of the Great Western investigations that I thought were being correlated with your investigations were ever forwarded to your office in Kansas City?

MR. TOWNLEY: I haven't specifically inquired, but I think not.

MR. SAMSON: Wasn't there some conversation about using the results of those investigations when you were here in Scottsbluff in July of 1963, with certain other individuals?

MR. TOWNLEY: That was in June. Actually, we went over the reports, representatives of Great Western and Holly plants and the two States, and there was no discrepancy or difference of opinion about what we had here at that time.

MR. SAMSON: I am not questioning that. I am just trying to clarify something in my own mind.

MR. TOWNLEY: I assume they were basically correlated, but as I said, I have never seen these.

MR. STEIN: Right at this point I want to say generally speaking that we have worked with Great Western in many other places. What has been done here is a measurement of physical facts. I would not imagine that there would be any differences between your measurements and Great Western's measurements. On the basis of our experience I am sure that Great Western is a very reputable and scientific operation. So your point is well taken that maybe they should have been used if they came in, but I would be very much surprised if there were any divergence between the two.

MR. SAMSON: I am not trying to raise any question here.

DR. SAMPSON: I was going to ask you about Holly Mr. Townley. Would you substitute the word "Holly" for "Great Western"?

MR. TOWNLEY: Yes.

MR. STEIN: You did not use Holly's information either?

MR. TOWNLEY: No.

MR. STEIN: Would you go on?

MR. TOWNLEY: In summary, I think we must again take cognizance of the improvement here which has been made since 1961. At that time the principal or major sources of pollution were the municipal complex here in Scottsbluff and the beet sugar plants. Of course, these smaller municipalities in between and one or two other industries also enter into it.

Since that time we have seen the completion, or rather the construction, of waste treatment facilities with modifications by the Holly Sugar Corporation. Mitchell has completed municipal trea[illegible] facilities, as has Great Western at the Mitchell sugar plant. The Scottsbluff municipality has put in waste treatment facilities. The sugar plant at Scottsbluff has. The Bayard Great Western plant has remodeled its waste treatment facilities. Certainly, this is substantial progress.

However, I think from the papers that have been presented here this morning, particularly the excellent biological reports by Mr. Geckler and by Mr. Clark, we would say that there is still interstate pollution existing at the State line.

In conclusion, Mr. Chairman, while a substantial improvement is noted in the quality of water in the North Platte River at the Wyoming-Nebraska State line, interstate pollution is still occurring. Additional treatment by the Holly Sugar Corporation of waste is necessary to eliminate interstate pollution and to restore the interstate reach of the North Platte River to the degree of water quality necessary to prevent interference with the use of that section of the stream. Proposed Nebraska improvement will materially reduce pollution now evident below the Wyoming-Nebraska State line.

MR. STEIN: Are there any comments or questions?

DR. SAMPSON: I think I would like to take that with a reservation.

MR. STEIN: I have one qualifying question here. I take it from reading your statement here that you assume that the basis for asking, in your recommendation for additional treatment of Holly Sugar Company waste -- one of the bases is the proposed Nebraska improvement will raise the quality of water.

MR. TOWNLEY: That is right.

MR. STEIN: That is a prerequisite or sine qua non.

DR. SAMPSON: I am going to reserve my statement until our time for presentation comes.

MR. SAMSON: I would like to raise one question. I have before me here the report on the waste disposal facilities, Holly Sugar Corporation, Torrington, Wyoming. It bears the signature of Russell G. Ludwig, Engineering Science Service, Inc., and I note in there a reference to flume waters. Do you know of any discussion had by any of the men from your office or on behalf of the Government with Mr. Ludwig or with Holly Sugar Company as to any standards concerning the quality of the flume water that he refers to in this report, that is coming into the Platte River?

MR. TOWNLEY: I had no such discussion and I know of none.

MR. SAMSON: Generally speaking, what connotation does "flume water" carry? Flume water -- what is it? That is what I wanted to know.

MR. TOWNLEY: Flume water, which we have discussed here this morning, from the Holly plant, is composed of only the water which is used to wash the beets -- to transport and wash the beets, unless I am in error.

MR. SAMSON: That's generally what it would mean in your way of thinking?

MR. TOWNLEY: Yes, sir; I think so.

MR. SAMSON: But you don't know that factually, if that is the situation at Torrington?

MR. TOWNLEY: I don't think there is any question but what it is.

MR. SAMSON: Thank you. That is all I have.

MR. STEIN: We hope to get through with this

D. A. Townley

before the cold weather arrives, which I know is on its way. Unless we have advice to the contrary that we need more time, perhaps we can have lunch in an hour and a quarter. Is that too short a period? If it is too short, we will take longer. But we will try for an hour and a quarter.

(Whereupon, at 12:00 noon, the conference recessed until 1:15 p.m. of the same day.)

AFTERNOON SESSION

MR. STEIN: May we reconvene?

Mr. Clare?

MR. CLARE: There is one more Federal representative, Mr. Chairman, I would like to call on for a statement or comment, and that is Ray Williams, with the Bureau of Sport Fisheries, Department of the Interior.

STATEMENT OF RAY C. WILLIAMS, UNITED STATES BUREAU OF SPORT FISHERIES AND WILDLIFE, GRAND ISLAND, NEBRASKA

MR. WILLIAMS: Mr. Clare, we have no formal statement. However, I would like to say that the Bureau of Sport Fisheries and Wildlife is concerned about all aspects of water pollution, and we will support any measures or moves to eliminate the pollution.

MR. STEIN: Thank you very much, Mr. Williams. Is there any comment?

(No response.)

MR. STEIN: At this time we would like to call on Nebraska. Do you have any statement that you would want to make, or do you want to call somebody?

MR. SAMSON: I will step aside for the Director of the Department of Health of the State of Nebraska, Dr. Rogers.

STATEMENT OF DR. E. A. ROGERS, DIRECTOR, DEPARTMENT OF HEALTH OF THE STATE OF NEBRASKA, LINCOLN, NEBRASKA

DR. ROGERS: I have no formal prepared statement, Mr. Chairman. But in some informal discussions this noon during the lunch hour, we found the discussions hinged on this point: Just what do we expect of Wyoming and what do we expect of Nebraska, and what are we going to do with our part of the river. This, of course, influences what we expect Wyoming to do with their part of the river. I think we agreed among ourselves over the luncheon table that we have made progress; we have made a considerable amount of progress on both sides of the State line. We agreed that there probably is more that needs to be done on both sides of the line. We didn't at this point think that we wanted to insist on making our portion of the river into a trout stream. This can be left to some future date, to decide whether it is going to be a trout stream or not.

We did agree that we should, as far as Nebraska is concerned, continue with every possible effort and with all possible speed to continue with the improvements on our side of the line where they are needed. We recognize that there are some places where they are needed. Likewise, if there are improvements that need to be made on the Wyoming side of the line, we would expect the Wyoming people to see to that. I have every confidence that they will.

We are confident that the surveillance that will be going on on both sides of the line and at the State line will be sufficient to keep us apprised of the conditions of the river that need further attention in the future.

Insofar as this conference is concerned, we are satisfied that it has served its purpose and would be perfectly happy to see it brought to its conclusion, fully recognizing the fact that at any time in the future we feel we are being hurt we could always ask for another one.

Does that state our position, Mr. Samson?

MR. SAMSON: I believe it does. I have nothing to add to that. But I think that there is some gentleman here from the Fish and Game and Forestation Department of the State of Nebraska who is prepared to make a statement. At this time I would like to ask him, or them, if that is true.

Would you come up and identify yourself and state your position?

STATEMENT OF WILLIAM SCHOENECKER, NEBRASKA GAME, FORESTATION AND PARKS COMMISSION, ALLIANCE, NEBRASKA

MR. SCHOENECKER: Mr. Geckler here this morning in his report brought out the movement of the rainbow trout in the North Platte River, and this movement does occur annually from October on into March and April. We feel that it is quite important a movement to contribute to the fishery resources of the North Platte River.

Now, in the past the movement has been largely in the streams below Minatare, and there are just two. We feel definitely that with the reduction of pollution in the North Platte River above, that this will seriously affect the distribution of the fisheries in the river. In other words, they will be allowed to proceed upstream.

These fish, I might add, are not stockers, so to speak. They are not a put-and-take fish. They do reproduce and travel up from McConaughy and are not of a source that are stocked by us, and their sustenance is mainly reproduction. In addition to this, we feel that there has been a great change in the river on the Nebraska side, in that based on this we are basing plans to introduce the sauger catfish in the North Platte River. This will be carried out next year, for sure, both above Scottsbluff and on down below. We feel that this will contribute greatly to a warm water fishery in this section of the river.

However, in viewing the whole situation, in looking at the Nebraska side, we believe that the companies and municipalities involved in this side of the river have made great improvements and have indicated that the last one at the Gering plant will make their improvements some time in the near future, we hope.

The warm water fishery we still feel, based on the benthological studies carried on by Mr. Geckler and the reports I am sure the Wyoming Fish and Game Department will give you very shortly regarding the effects on fish in the Henry, Nebraska, area on down in that area -- we feel that the Holly Sugar Company in Wyoming still is contributing the quality of water that is not of the best interest to our fishery in this section of the river. So, therefore, we would like to see appropriate steps taken to rectify this condition, and I believe that if this does take place and the improvements are made on the Nebraska side -- and they have already made great advances--that this warm water fishery can be established in this area.

I don't believe I have anything else at this time, unless there are questions.

MR. STEIN: Are there any comments or questions?

(No response.)

MR. STEIN: Thank you very much.

MR. SAMSON: I would like Mr. Harold Burk of Great Western Sugar Company, who is a member of the Water Pollution Control Council, having been a member since it was originally constituted back in 1956, to make a statement. Mr. Burk is accompanied by Mr. Jensen from Denver.

Harold, would you like to take the ball or would you like to have Mr. Jensen take it?

MR. BURK: I prefer that Mr. Jensen do it. I just don't know what we have to say. I think most of it has been said today about the Great Western. Maybe a little rebuttal from Mr. Jensen may be in order.

MR. SAMSON: Harold, I have seen your installations at Bayard and at Scottsbluff and at Mitchell, and we are very proud of it, and I wish that you would just for the purpose of the record give what you are anticipating doing over in Gering. Would you elaborate on that a little? I think that is something you ought to mention.

STATEMENT OF H. D. BURK, GREAT WESTERN
SUGAR COMPANY, SCOTTSBLUFF, NEBRASKA

H. D. Burk

MR. BURK: We first started on this about 1951. There are some people in this room who worked on it in Bayard. Since that time it has been a gradual evolution and going back some years and also going ahead some years.

During the summer of 1962 we received an appropriation to put in waste water in here, and through our work with engineers and people in our company we have this lagoon system, and we put it in at Scottsbluff. Much to our surprise during the prior campaign we didn't discharge anything to the river. It consists of two series of three lagoons each, separated by Winter Creek, which is a drain ditch. We have about 200 acres in the area -- 220 acres total area.

Our method of operation is to run the waste water in one side until it gets up practically to the overflow point through a series of three lagoons. The mud is set out in the first lagoon, which possibly has 35 acres, and the water from that, we hope, aerates. The next lagoon there has the same area, and the third lagoon is a finishing lagoon where we hope it will get reduced further, reducing the B.O.D.

If it works successfully for this year -- last year we also did this at Bayard. We had the three lagoons where before it was just one lagoon. Due to our inexperience we didn't construct our lagoons high enough to withstand the waves on the 50-mile-an-hour winds, and we lost one of ou cross-dikes, which resulted in a different situation. However, we settled out all the solids. The only detriment to this -- or, I should say, the only detrimental effect was that the B.O.D. wasn't quite as low as we thought it ought to be.

This year we rebuilt the dikes at both Scottsbluff and Bayard, where we attempted to withstand the wind erosion. So far they have been very successful.

With that experience we went to Mitchell this year and put in an installation up there with everything we have learned from the other two, plus one innovation and we are not sure just how effective it will be. We hope it will help eliminate the only bad feature about this lagoon system, which is odors. Wherever you put any organic material into a lagoon you are going to have odor, despite anything you do. We haven't had too many complaints on the odor. There is none at Mitchell.

At Mitchell we are trying a new system. Throug research we found that it had been used successfully in Europe. We divided this first lagoon into three compartments, and we are running the water 48 hours in one compartment -- about an 8-acre compartment -- and at the end of the 48 hours we cut it over to the second and drain the first one. Then, at the end of the next 48 hours we cut it out of the second one and drain the second one and go back to the first one again after another 48 hours. We think it has reduced the odor problem to some extent. However, we still have a little odor.

Up until this date we ran now for about 40 days and made no discharge to the river out of the Mitchell lagoon. My estimate is that before the end of our campaign which will be in February, we may discharge some water. However, we feel due to our experience at Bayard with the water that does go in, it will be practically as good as the water that is in the river, with the exception of a little bit higher up B.O.D.

We have similar plans for Gering if and when the money is available to complete the job.

I think that does what you want me to do. Maybe Mr. Jensen has a few comments.

MR. SAMSON: Mr. Jensen, do you have anything further to add?

STATEMENT OF LLOYD T. JENSEN, GREAT WESTERN SUGAR COMPANY, DENVER, COLORADO

MR. JENSEN: I can't add to that. That is quite a detailed report of recent activities. These, of course, have been brought about since the initial hearings in 1961. But previousto that period there were quite substantial improvements made also, principally by the elimination of the Stevens wastes, which are by far the strongest wastes the industry produces.

This, together with the elimination of pulp water and pulp press water, which was brought about by the installation of the diffusers, has been accomplished. This has contributed to the reduction of the pollution in the North Platte River.

I am a bit confused today, I will admit, after listening to the testimony this morning, because I am now a little uncertain as to the importance of biological treatment versus the bacteriological problem now, and I am not quite as confident as I was once about us doing the right thing all the time. Maybe it points up one of the problems we have had in the industry and one of the problems that the technical people have also. I think yet today there is too little knowledge about this whole subject of what comprises pollution, and how things should be treated. All of us could attempt at least to find out as much as we can about it, and what affects river conditions, and so on. Our company is going to make real efforts to try to get research work done on the treatment of water works, because the traditional methods available to us today are not, in my opinion, very satisfactory.

Thank you very much.

MR. STEIN: May I just ask one question?

I think Mr. Burk's statement was a little less optimistic than I think I heard in here, or possibly it was outside. But you said that the Gering improvements, water pollution control improvements, were going to go in when and if money becomes available.

Recognizing your position in the company and my being a bureaucrat, we have to say the same thing. I heard it may happen next summer.

MR. JENSEN: I think the matter revolves partly as to my responsibility. We are surveying in Colorado and Montana. We have the same problem in those States as you have here, and we have the same responsibilities both to the public morally and politically, and in every direction. We are going to expand our expenditures for waste treatment very definitely this year, and I think that the Gering treatment system will be in the budget. It has been requested and unless there are pressures brought upon us by the people here that we can't possibly resist, I think we will have it. That isn't definitive, maybe, but it is the best I can do at the moment.

DR. SAMPSON: It is understandable, though.

(Laughter.)

MR. SAMSON: Mr. Filipi, our hard-working secretary, is here, and I am sure he has a few remarks.

Ted, would you give us the benefit of your thinking and observations?

STATEMENT OF T. A. FILIPI, NEBRASKA
DEPARTMENT OF HEALTH, LINCOLN, NEBRASKA

MR. FILIPI: My name is Filipi and I am with the Nebraska Department of Health.

You will recall, gentlemen, that the Nebraska State Department of Health back in 1956 prepared a program that they submitted to the Surgeon General for the administration of this public law in Nebraska. In that program there were certain dates of construction included. This included the program for the municipalities along the North Platte River with the target date of 1966, by which time there will be no untreated waste discharged into this river.

We are very proud to report that we are ahead of the schedule that we requested of these municipalities back in 1956. For instance, the community of Henry was told that we would like to have their waste treated by 1966. That plant is in operation. Morrill was told that their target date was 1966. That plant is in operation. Mitchell was told to have theirs in by 1964, and according to the schedule they were in operation before 1964.

Now, this leaves us just two communities -- I should say three communities -- that really have not proceeded with the program according to our schedule, one of which is Gering. The other is Terrytown. We have met with representatives of these communities and I think that we could get immediate action from these communities if we so requested them. However, in lieu of looking at the overall program it was our opinion that it would be better to wait six months or a year to get a proposal that fits this area better than to have these people put it in and say, "We have done our obligation."

Now, it is the opinion of our Council in many of these situations perhaps better to delay it for six months or a year, rather than do something haphazardly and hurriedly. As far as these towns are concerned, they will all put in a lagoon if we tell them to, or if we let them. Now, we are concerned if a lagoon is the answer for these communities, where a considered effort might be used. The other communities, with the exception of one, and I think that was brought out in the record already, Bayard, have already proceeded along with their program to a place where they are in the planning stage, and we have no opposition from Minatare and Henry -- the only two towns which are on the line which are not under construction.

So, therefore, I believe that these communities and industries have complied with the request of the Nebraska Water Pollution Council, and it is somewhat embarrassing to tell the communities at one time that you want a program in 1965 or 1966, and then go back and say we want it in 1964.

So, for the purpose of the record, Nebraska is proud of the progress that was made on the North Platte River.

MR. STEIN: Are there any comments or questions?

Mr. Filipi, I wonder if you would expand on that Bayard situation? The reason I ask you that is that as you may know, this may involve a Federal question.

MR. FILIPI: Unfortunately, the Bayard situation is one of legal status and not engineering. It appears that back in 1918 the city of Bayard entered into a contract with the Bureau of Reclamation in the construction of a drainage ditch, and in that contract it was agreed that the persons that are using this drainage ditch will annually contribute to the maintenance thereof, for which they have the privilege of discharging all the liquid wastes therein.

MR. STEIN: The liquid wastes of the city?

MR. FILIPI: All of the liquid wastes therein. This includes storm water; it includes sanitary wastes, and, in fact, any wastes that are created within the community of Bayard or within any of the other places who entered into this contract.

MR. SAMSON: Do you think a lawyer had anything to do with that, Mr. Filipi?

MR. FILIPI: We know very well it wasn't an engineer.

MR. STEIN: According to the Bureau of Reclamation, they, of course, say that there are no legal rights to do that at all, and as far as I can tell from their records we were in existence then; but the Department of the Interior and Bureau of Reclamation lawyers deny having anything to do with this. The only conclusion we can arrive at is that there must have been engineers, but I guess they weren't very civil.

(Laughter.)

I think here is a question of a State -- and I don't want to talk about this legal validity or not -- but what you are saying is that the State or Federal Court is going to enforce an alleged contract which gives a community a right to discharge untreated wastes into a ditch. Is that what you are going to have to wait on in Bayard?

By the way, I am not directing this at the State, because we recognize that there is a Federal problem here, but this has to be met.

MR. FILIPI: I believe that the contract was submitted to you and we never received an opinion as to where it is. For the purposes of the record, it is my opinion that Bayard will treat their sewage because of the fact that this happens to be a pattern in Nebraska, and I think the records will show that we have now waste water treating plants under construction in places where ten years ago everyone would have said it would not be done, and therefore we are, by a matter of persuasive coercion, fulfilling the obligation of the Nebraska Water Pollution Control Council to see that the Nebraska waters are protected in the best interests of the people.

(Laughter.)

MR. STEIN: You have a schedule for 1966? Do you think that Bayard is going to fit within the schedule of the other towns, or will it be a little longer?

MR. FILIPI: I am going to say something and immediately the Bayard papers are going to carry it like the last time. I don't believe that the people of Bayard will shun their responsibilities when the time comes to fulfill their obligations.

MR. STEIN: We hope they will meet the schedule of the other communities in this area.

MR. FILIPI: I think so.

MR. STEIN: This is not a question to you, but I think obviously, in State governments too, where a contract is let or where it is supposed to be let in with another department -- in this case the Department of the Interior -- I think you can appreciate that it is not for the Department of Health, Education, and Welfare to comment on the validity or nonvalidity of the contract. I have worked with the people in the Department of the Interior for over twenty years and I have every faith in their judgment -- in their legal judgment -- in determining this.

According to the Department of the Interior people and our advice from them, they do not believe that they have signed a contract giving Bayard the right to discharge raw wastes into their drainage ditch. We support the Department of the Interior in this interpretation of the contract, and I think this is as far as we can go.

Now, from the State point of view, I think you should recognize this view of what the contract means from the Federal point of view. We do not believe this gives Bayard the right to discharge untreated wastes.

MR. SENSINTAFFAR: Perhaps you know more about this contract with the City of Bayard than I do, but as I understand it, Bayard is supposed to operate and maintain a certain drainage system or a portion of it, along with several other irrigation districts. As I understand it, a few years ago Bayard asked to be relieved of this operation and maintenance charge, and these other irrigation districts would not relieve them, as I understand it.

MR. FILIPI: That's right.

MR. SENSINTAFFAR: Did they give that as an excuse for not building this sewage plant? Is it because they cannot be relieved of the operation and maintenance charge of that drainage system?

MR. FILIPI: In discussing the situation with the municipal officials of Bayard, that was one of the reasons given for this, because during our conversation it was brought out that it would be more economical for the city to build a waste water treating facility and be relieved of the maintenance of this drainage ditch than to operate under the present status. But they attempted to be relieved of this obligation and they could not. The maintenance of this ditch is quite heavy at times.

There are other details in it in which the municipal officials of Bayard, like all other municipal officials say, "You haven't shown us where we are polluting or contaminating the North Platte River." Well, that again is questioned. But our overall program is one of treating the discharged waste pollution itself without waiting to see what effect it has downstream, because here again, when you get into pollution, I think for the last three conferences of this group you are attempting to ask what is pollution. I think that our Council in Nebraska has taken the attitude that the discharge of untreated waste is pollution.

MR. SENSINTAFFAR: I just want to make a statement that we will check into this contract, and this is largely educational to us. We will check into the contract and see what the situation is.

MR. STEIN: Thank you very much.

MR. SAMSON: That will be really helpful, sir.

MR. STEIN: Thank you very much, Mr. Filipi.

MR. SAMSON: Is the manager of the Swift plant from Gering here?

(No response.)

I am told he had to leave. I am sorry. I would like to have heard from him.

Is there anyone else from Nebraska here whom I haven't called on?

(No response.)

We thank you very much.

MR. STEIN: Thank you.

Dr. Sampson, from Wyoming. May we call on you?

FURTHER STATEMENT OF DR. JAMES W. SAMPSON, WYOMING DEPARTMENT OF PUBLIC HEALTH, CHEYENNE, WYOMING

DR. SAMPSON: Mr. Stein, I would like to make one statement definitely for the record.

I attended the first meeting held here in Scottsbluff some three years ago. At that time it appeared to me to be a hearing not between the State of Nebraska and the State of Wyoming, but a hearing between somebody and the Holly Sugar Company. I detect a slight overtone along that line today, except that I also note that Great Western is involved a little bit, too.

I would like to state that in the State of Wyoming stream pollution is the responsibility of the State Department of Public Health. We have a legally constituted Advisory Stream Pollution Control Council, and I would like to state that these two legally constituted bodies made requests of the Holly Sugar Company with regard to the discharge of effluent into the North Platte River at their plant in Torrington.

Emphatically, I would like to state that the Holly Sugar Company has more than discharged these requests and, in fact, with regard to B.O.D., the original goal which was set, as I recall, two years ago was that it would be 8 pounds per ton of beets processed. The present B.O.D. is 3 pounds of B.O.D. per ton of beets processed by the Holly Sugar Company in Torrington.

I feel further -- and before I make my final summary statement I perhaps think that we should ask our game and fish people to make their report, if they so wish, on this reach of the North Platte -- but I feel that there has been substantial compliance of Wyoming to eliminate pollution in the stream.

I will have a concluding statement after we hear from Mr. Bosley, if he wishes to report at this time.

Who is going to make the report?

STATEMENT OF FRED EISERMAN, WYOMING GAME AND FISH COMMISSION, CASPER, WYOMING

MR. EISERMAN: I am going to make it, if you so desire.

I would like to defer some of the detailed aspects of what we have considered pollution to Cliff Bosley, who has been our field man on this job since 1957. But I think I can state our position very simply, that at the present time, as a result of this fall's activities in the field, there are waste materials being discharged upstream from the Wyoming-Nebraska State line which have a lethal effect on fish.

There are two points to bring out here, perhaps. There is indicated as a result of this fall's work, that there are lethal materials in the stream that have so-called instantaneous effect -- lethal effect on fish. I think as a result of Mr. Geckler's work and some of our own work, that there is a long-term environmental deterioration of the habitat, which also has a lethal effect on fish.

Before I get into too many details -- and I want to stay away from the details -- if the Chairman so wishes, I would like to have Mr. Bosley summarize some of our field activities. If there are any further comments, Mr. Bosley and I will be available for comment.

MR. STEIN: Mr. Bosley.

STATEMENT OF C. E. BOSLEY, WYOMING GAME AND FISH COMMISSION, LANDER, WYOMING

MR. BOSLEY: Thank you.

C. E. Bosley

Since 1957, the Wyoming Game and Fish Department has conducted annual surveys to determine the effect of waste waters discharged by the Holly Sugar Refinery at Torrington, Wyoming. From 1957 to 1961 these studies were confined to the effect on bottom-dwelling organisms and on the distribution of fishes within the immediate vicinity of the discharge. The results of these studies indicated an annual reduction, or elimination, of the bottom fauna below the outfall and a relative absence of game fish in the area affected by the outfall despite the fact that this section is stocked on an annual basis.

In 1961, at the request of the State of Wyoming Stream Pollution Advisory Council, the Wyoming Game and Fish Department conducted tolerance tests with rainbow trout. These fish were placed above and below the refinery outfall to determine if abatement measures taken by Holly Sugar, prior to annual refinery operations, were sufficient to allow game fish to live downstream from the discharge point. The results were not encouraging. Test fish placed 50 yards below the outfall died in a matter of hours and those placed a mile below the discharge died within a few days.

During this year's refinery operation, the Wyoming Game and Fish Department again placed live cars containing fish in the river. The number of live cars were increased and the test section of the river extended to Henry, Nebraska. The results of these tests are attached as a separate report (Part 2).

In addition to the live car tests, chemical checks were initiated to determine if the refinery waste contained compounds which were toxic to fish, notably saponin.

Objectives:

1. To determine if saponin is present in the waste waters being discharged into the North Platte River by the Holly Sugar Refinery at Torrington, Wyoming.
2. To determine if saponin can be detected in the blood stream of fish exposed to known concentrations of saponin.
3. To determine if saponin can be detected in the blood stream of game fish exposed to the discharge from the Holly Sugar Refinery at Torrington, Wyoming.

Methods:

Toluene, an organic solvent, was used to make extractions of water samples taken from above the outfall, the outfall, and at various points downstream from the outfall as far as Henry, Nebraska. Toluene extracts were also made on the blood of fish exposed to known concentrations of saponin, and of fish contained in live cars above and below the refinery outfall. Purified saponin powder was dissolved in water and extracted with toluene to serve as a standard.

These extractions were concentrated and subjected to chromatographic procedures as described in an article entitled "Paper Chromatography of Cardia Glycosides, Aglycones, and Acetates" by Heftmann E., and Levant, A. J. (1952a) Journal of Biological Chemistry. 194, 703-709. This procedure enables an analyst to detect saponin through utilization of short-wave ultraviolet light, a source of 2537 A radiation.

Findings:

ULTRA VIOLET FLUORESCENCE INDICATING PRESENCE OF SAPONIN

Water Samples

1.	Above Holly Refinery Discharge	Trace
2.	Opposite discharge, left side river	Trace
3	½ mile below discharge, left side river	Trace
4.	Below Holly Refinery Discharge, right side	Positive
5.	½ mile below discharge, right side river	Positive
6.	Henry Nebraska Bridge, both sides of river	Positive
7.	Purified saponin control solution	Positive

C. E. Bosley

FISH, BIO-ASSAY

Control fish	Negative
17 hr. at .5 ppm saponin	Negative
17 hr. at 1.0 ppm saponin	Negative
17 hr. at 1.5 ppm saponin	Negative
50 hr. at 20 ppm saponin	Positive
50 hr. at 10 ppm saponin	Positive
50 hr. at 5 ppm saponin	Positive

FISH, RIVER LIVE CARS

1.	Control Fish	Negative
2.	3 hr. exposure 50 yds. below outfall (all fish dead in 9 hrs.)	Trace
3.	19 hr. exposure ½ mile below outfall	Positive
4.	Henry Nebraska Bridge 19 days exposure	Positive

Discussion

Saponins are water soluble glycosides characterized by special properties, namely, the ability to lower the surface tension of water and hence to cause foaming, the ability to destroy red blood corpuscles (haemolysis) and the ability to kill fish, all at relatively low concentrations. They are found in many plants, and they occur in wastes from potato-starch and sugar-beet factories. The toxic limit of this substance for most fish appears to be from 5.0 ppm to 100 ppm (Water Quality Criteria -- State Water Pollution Control Board, 1957, Calif. Publication #3, p. 349), depending on the hardness of water and length of exposure to compound.

Chemical tests conducted during the course of this study indicate that saponins are being contributed in waste waters discharged by the Holly Sugar Refinery at Torrington. Saponins were also recovered from the blood of fish exposed to the waste waters from Holly Sugar, and are detectable as far downstream as Henry, Nebraska. Since these saponins are toxic to fish it is only reasonable to assume that they are responsible, at least in part, for the inability of game fish to survive during operation of the Holly Refinery.

LIVE CAR EXPERIMENT

Introduction:

Pollution studies on the North Platte River from Torrington, Wyoming, to the Wyoming, Nebraska, State line, included the use of live cars containing rainbow trout. Similar work was done in 1962, but was limited to about

1½ miles below the outfall from Holly Sugar Corporation's Torrington Mill. The work in 1963 was extended to include the distance to the State line and to both sides of the river. The objectives of this study were to determine the distance downstream that mortality occurs and the rate of mortality from Torrington to the State line.

Procedures:

Ten live cars were used, each containing four to six rainbow trout. These live cars were located in the river at varying intervals to the State line. Three stations were placed above the confluence of Cherry Creek Drain (approximately 6 miles below Holly Sugar outfall), with a live car on each side of the river. One station was located about midway from Cherry Creek to the State line (approximately 7 miles below Holly Sugar outfall), and the other at the Henry, Nebraska, bridge (9 miles below Holly Sugar outfall).

A live car was placed above the Torrington bridge as a control. It was located below the old pumphouse on the south side of the river, in the edge of the live water from the river channel. This was abandoned as a control due to apparent toxic seepage from the lime pit lagoons located above this point just south of the river.

Another control live car was placed opposite the first control, above the Torrington bridge, on November 3.

Discussion:

The findings of the 1963 live car study are shown in Table 1. The occurrence of mortality is denoted by an increase in percent of mortality at any given location. The first two incidences of death are figured in hours, as well as days. The live cars were observed closely the first five days. After that they were checked periodically at intervals of not more than three days; hence the two categories of mortality rate.

When the additional control was established (November 3) above the Holly Sugar Company outfall, new fish were also placed in the live car on the right side of the river at the city dump (3 fish - ½ mile below Holly Sugar outfall), and another live car was put in at the State line (4 fish) replacing the one that had been lost from this station. The replacement fish at the State line appeared normal at the 48-hour check, but two of the rainbow trout were dead when checked in 7 days (November 10). The replacements at the city dump survived the first seven days, but all were dead on the tenth day (November 13). The fish in the additional control remained healthy (November 13).

C. E. Bosley

The fisheries management plan for the North Platte River from the Wyoming-Nebraska State line to Fort Laramie calls for the reestablishment of two native game fish -- the channel catfish and the sand sauger -- plus supplemental spring and fall plants of catchable rainbow trout.

Habitat improvement devices, which had been tried experimentally in this section of the North Platte, will be installed to improve cover and food producing areas.

Present stocking schedules call for reintroducing channel catfish from the Cedar Bluff Hatchery in Kansas during 1964, with habitat development consisting of tiles and other cover and food producing devices being installed prior to the plant in mid-summer.

As can be evidenced from the data presented in Table I, during the period of operation of the Holly Sugar Refinery at Torrington, substantial amounts of pollution enter the North Platte River immediately below the Torrington Bridge. This pollution is sufficient to prevent the establishment of a successful fishery. Test fish showed significant mortality when subjected to waste discharge from Holly Sugar Company as far downstream as Henry, Nebraska, the farthest downstream point checked.

(Table I referred to is as follows:)

TABLE I

CUMULATIVE % MORTALITY RATE OF RAINBOW TROUT IN LIVECARS IN THE NORTH PLATTE RIVER FROM TORRINGTON, WYOMING TO THE WYOMING-NEBRASKA STATE LINE

MORTALITY RATE OF LIVECAR FISH

Location	Days From Being Placed In River (%)											Incidence of Death (hrs.)					
	1	2	3	4	5	8	13	19	22	26	29	1	2	3	4	5	6
100 yds. below outfall Right side (6 fish)	33	100	-	-	-	-	-	-	-	-	-	3	9	19	19	19	19
Left side	40	40	60	60	60	60	80	80	80	80	80	7	7	55	168		
City Dump																	
Right side	0	20	60	60	60	60	60	100*	-	-	-	32	47	47			
Replacement (3 fish)								/	0	0	100						
Left side	0	0	20	20	20	20	40	40	60	60	60	54	290	314			
Cherry Creek																	
Right side	20	20	20	20	20	20	100	-	-	-	-	7	290	290	290	290	
Left side	0	0	0	0	0	20	20	60	80	80	80	170	314	314			
Walstead																	
Right side (6 fish)	33	33	33	33	33	50	50	50	50	50	50	21	24	307			
Left side	0	20	20	20	20	20	40	40	60	60	60	90	307	330			
Henry Bridge																	
Right side	20	20	20	40	40	40	40	**	60	60	60	24	90				
Left side	0	20	20	40	40	-	-	-	-	-	-	48	90				
Replacement (4 fish)								/	0	50	50						
Original control	20	20	20	20	20	20	40	40	80	-	-	22	290				
Control (6 fish)								//	0	0	0						

1. Walstead and Henry bridge stations were put in Oct. 15, p.m., the others were put in Oct. 16, a.m.

2. Right or left side as you look downstream.

* Fish remaining Oct. 28 were dead by November 3.
** One fish removed for blood sample, not counted as mortality

MR. STEIN: Thank you.

Are there any comments or questions?

DR. SAMPSON: I don't believe so.

DR. ROGERS: What was the indicator of fish that you used?

MR. BOSLEY: Rainbow trout.

DR. ROGERS: Did you did disperse those across the entire reach of the stream, or were they at just one portion of the stream?

MR. BOSLEY: They were placed on both sides of the stream. They were placed above the discharge point and at the sides -- both sides of the stream -- at Henry, Nebraska.

MR. STEIN: Thank you very much.

DR. SAMPSON: Mr. Browning, would anyone from your firm like to make a statement at this time or not?

STATEMENT OF J. E. BROWNING, HOLLY SUGAR CORPORATION, COLORADO SPRINGS, COLORADO

MR. BROWNING: All I can say is that I am Mr. Browning, Colorado Springs.

We are getting a lot of free advertising today. I told him I would just as soon not have it. We thought our problem was fairly well resolved.

At the last conference we presented a certified plan by qualified sanitary engineers which seemed to be acceptable to the conference, and, as was stated here today, in that report we estimated we would reduce the B.O.D. by at least 85 percent. It was stated today that we would reduce from 88 to 90 percent.

We carried out all phases of the operation that we said we would and, frankly, this recurrence or continuation of this conference is a surprise to us. We don't know what we are expected to do next.

That is about all I can say. I didn't come prepared to say anything, as a matter of fact. As I say, I wonder just how far we are going to have to go, or how many times we have to come back and tell our plans.

DR. SAMPSON: I think at this time I am going to, unless there is someone --

MR. SAMSON: Could I ask Mr. Browning a question or two?

Mr. Browning, are you familiar with these saponins that have been referred to -- the water-soluble glycosides?

MR. BROWNING: Mr. Jensen and I have both chemical backgrounds in the sugar business and we are extremely skeptical of such statements. Saponin does occur occasionally in some plants. We know it is from a tree. I forget the name of the tree. It is humanly edible and the occurrence in any quantity that would be lethal to fish would take a lot of proving to me.

MR. SAMSON: Do they physically manifest themselves by foaming at the outfall?

MR. BROWNING: Saponin is a source of foam all right, but it is not the only source of foam.

MR. SAMSON: I appreciate that.

MR. BROWNING: The foam conditions at the outfall this year, since we have taken the return out of the sewer, is negligible. There is none there, as a matter of fact. If you have been by there in the past few days --

MR. SAMSON: I was there yesterday afternoon, Mr. Browning.

MR. BROWNING: What do you think about the foam condition?

MR. SAMSON: I wanted to find out for myself what the situation was, and there was some foam right at the outfall. It extended down about three or four yards and sort of spread out. But I was wondering -- maybe I shouldn't get into this, but there seemed to be a lot of oil and such things as that floating at the outfall and I wondered where that would come from.

MR. BROWNING: You saw more than I did. I didn't see any oil at the outfall. I was there yesterday afternoon too.

MR. SAMSON: I didn't see you.

MR. BROWNING: I am not saying you were not there.

MR. SAMSON: I didn't see you there. I didn't mean to be facetious, but there was a heavy layer of oil or something coming out of this outfall, and I just wondered -- it had the smell of kerosene or oil of some kind.

MR. BROWNING: I can't imagine myself. We use a vegetable oil accepted by the Food and Drug Administration. This might have been some foam-breaker. But that isn't a continuing condition, I feel sure.

MR. SAMSON: What about the heavy discoloration that seems to come out that follows the bank on down?

MR. BROWNING: Silt -- just silt. Silt from washing beets. It is a very light silt. It is the silt from the beet itself.

I pointed out in Cheyenne that we take 180 to 200 tons of material -- we can't very well get them dry and we wash them off. We wash the beets very thoroughly before they go into process. This light silt will stay in suspension for several hundred yards or a mile or more. That is a discoloration. This has been a fairly dry season I have seen it a lot worse.

MR. SAMSON: That's all I have. Thank you very much, Mr. Browning.

DR. SAMPSON: I feel that what has happened to us in this hearing is that we have moved -- my original understanding is that this complaint from the State of Nebraska to the State of Wyoming about pollution of the stream dealt with health and welfare of people. We are finding that it is the health and welfare of fish. As a fisherman, I like to catch them too. However, there has been more than substantial compliance by Wyoming in taking steps to eliminate pollution in the stream, and at this time there does not exist sufficient pollution to endanger the health or welfare of any persons. Therefore, I move that this conference be concluded, and that the record be closed.

I gather from the remarks that Dr. Rogers made, that the State of Nebraska joins in this motion, Mr. Chairman.

MR. STEIN: Is that the conclusion?

DR. SAMPSON: Yes.

MR. STEIN: When the law speaks in terms of health or welfare of any person, when it deals with welfare it doesn't deal with personal welfare in the sense that a Health Department operation deals with it. I think the law is pretty clear. Obviously, we have to protect public health and include such things as conserving the public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, and agricultural and industrial and other legitimate uses.

It seems that at least the interpretation we have had, the Congress has had on this Act--and this has been gone over many, many times -- the destruction of a recreational facility or fish stream is something which very well may be detrimental to the welfare of persons. You may have a disagreement on the interpretation of the Federal Act, but this is the way we have always interpreted the Act, and I think that that is a fairly fair interpretation.

Now, to get to the next point, as far as termination of the conference is concerned, this is something beyond my authority. This is something which can only be done by the Secretary. He has not delegated that to me, or to anyone else, as far as I know. He has just designated me as chairman of the conference to bring back a report to him, and we will be delighted to do it.

DR. SAMPSON: Convey those wishes to the Secretary.

MR. STEIN: I am under a duty to convey those wishes.

Does anyone else feel he wants to say anything here?

DR. SAMPSON: Our Commissioner of Agriculture, Mr. Engendorff, would like to say something.

STATEMENT OF O. HENRY ENGENDORFF, COMMISSIONER OF AGRICULTURE, WYOMING DEPARTMENT OF AGRICULTURE, CHEYENNE, WYOMING

MR. ENGENDORFF: Mr. Chairman, my name is O. Henry Engendorff. I am Commissioner of Agriculture for the State of Wyoming, and also a member of the Wyoming Stream Pollution Advisory Council.

I just jotted down a few notes here. I don't have anything to turn in.

From what I have observed so far -- and I have attended all of your conferences -- I have listened to a lot of presentations, discussions, and so forth -- I feel that on behalf of agriculture in the State of Wyoming that the waters of the North Platte River, both above and below Torrington, are suitable for agricultural uses, which includes irrigation. You notice I haven't used the words "Holly Sugar," because I think they have been used here too much anyway. Agriculture, being Wyoming's leading industry, I feel that on behalf of the people of the State of Wyoming I must insist that the whole matter as it affects agriculture and the public in general must be considered. Notwithstanding our acknowledgment, the quality of water as it affects public health must be the predominant and controlling factor.

We in agriculture also recognize the importance of recreation, which includes fishing. Wyoming has many miles of excellent fishing streams, excluding this portion of the stream which has now been under consideration.

Now, apparently the majority of people in Goshen County, which is the county adjacent to Nebraska, preferred to retain their agricultural interests in this area as a predominant factor in the eight miles of river which we are now talking about, over the fact that there is a possibility that this may some day be made into a fish stream. Now, this is borne out, as I understand it, that this stream has not been considered as a fish stream or a sports fish stream -- whatever the proper term is that should be used -- for over thirty years. I do not have any information at hand that the people of the State of Wyoming, adjacent to your State of Nebraska, have been putting any particular amount of pressure on our Game and Fish Department or other officials of the State of Wyoming to turn this particular eight miles of stream into a strictly recreational fish-type stream.

I might also add -- and I don't say this facetiously, but I say it sincerely -- that I happen to be a duck hunter and I like to hunt ducks. I have observed from some of my own personal experience that the duck hunting is a little less perhaps since we have taken out some of the so-called pollution from our beet factories in this particular area. So we have to consider all aspects of recreation, sportsmen, and so forth.

I have attended all the conferences and I am now somewhat confused as to the purpose of the conference, and what results we are actually expecting. The first conference that I attended, as I recall, we talked primarily about the health aspect of the thing. I think we dwelt on this quite considerably. Certain things should be done -- and I think the record will bear out as far as Wyoming was concerned, from the health aspect, we have complied with those.

The second conference we spent most of our time talking about sugar companies. Holly's name was mentioned, and Great Western. They are both in our State and we love them. We wish they had more plants in Wyoming. They are good companies to do business with. But, as I recall, we spent quite a bit of time on our second conference -- in fact, most of it -- discussing what we thought the sugar companies should be doing.

Now, our third conference was today. A new problem seems to be predominant, and we are talking primarily about fishing. It looks to me like we are considering, or attempting to consider here, or bring into the picture -- and perhaps it is right -- should the Platte River be considered from maybe one end to the other as strictly and predominantly a fishing stream, rather than industrial, agricultural, other things that affect the economy of not only Wyoming, but your community as well.

We have had three conferences. Perhaps we should have one more conference and this time to consider the agricultural aspect and take into consideration the overall economy effects which would affect all segments of the people of the area concerned.

I was glad to hear the Chairman point that part out. I think he mentioned it briefly just before or just after Dr. Sampson made his statement that he recognized that the Secretary of Health, Education, and Welfare was going to have to take into consideration several aspects -- more than just what we perhaps brought out here so far. He did mention -- and it is the first time I heard the word "agriculture" mentioned -- he mentioned that also. I certainly want to echo that, that agriculture is basic in the State of Nebraska, particularly in the Panhandle country, basic in the State of Wyoming, and we will give way to the health aspects. It affects the health of our people, but I think you better give a second thought and a lot of consideration as to how this overall problem that we are talking about could be prevented from becoming a serious situation.

We are sitting here, a small group of us, and when we start talking about what we are going to do with these interstate streams because they have a definite effect, we in Wyoming are very jealous of our water. You folks in Nebraska like it quite well. We wish we could put a little gate up here. The water you don't use here we could use on some of our land. Fortunately, a long time ago this was taken care of by some folks in your State, who looked ahead and saw where they could use some of our good water.

I think I have probably said enough. I hope myself that this can conclude these conferences. Unless we want to get into a much broader aspect of it, and this is what it seems like we are going to do, I think we better conclude.

I certainly would like to second Dr. Sampson's motion that this thing be brought to a close and at least take a little time and consider and see exactly where we are going, what we are after, what standards we are shooting for. I have heard a number of standards mentioned here orally. I have never seen anything in writing. Maybe you have, and Dr. Sampson has, but I do think we should give a lot of thought to this. We are talking about serious business here when we are talking about water, especially Wyoming water.

MR. STEIN: Are there any comments or questions?

MR. EISERMAN: Just for the record, to comment on some of Mr. Engendorff's remarks: Actually, it may be indicated by his statements that the fishery aspect was one that was considered at a later date, but by law we were wrapped in this situation since 1957. However, in 1961 there was an official request made by the State of Wyoming Stream Pollution Advisory Council that we conduct tolerance tests.

So just for the record, I would like to make sure that that is in there.

MR. STEIN: I think we also have to point something out for the record. By the way, I assume you said you were confused for the purpose of introduction, because I have never seen anyone refute that statement as rapidly as you did once you made it. You didn't seem very confused at all to me.

I think we have to take this in perspective. One, we came for the first conference because we were asked to do so by the official State agency of Nebraska. Under the Federal law we have no option. We must. There is absolutely no choice on our part to do that. We followed the first one through because this was a relatively complicated problem. By the way, when you said we dealt with the sugar beet companies, this is agriculture and an agricultural industry. This is primarily the overriding issue here. If it weren't for this important industry, this would be a very simple problem to solve. But we needed two conferences in order to get at a relatively complicated situation.

As far as I was concerned, and I think the Secretary was concerned in Washington, we were prepared to let this go on and see if it could be resolved at a State level. The States were required to do our surveillance work.

Again, at the request of the technical people -- our technical people and the technical people of both States -- it was asked that the conference be reconvened, because the conferees might resolve some questions they did not feel the technical people could resolve.

So in all cases I think this conference was really not initiated by the people in Washington. We have a lot of work to do and, as I say, we like to disengage from that. I think the record should show this. We are at the service of the States, the State agencies, and, of course, our own technical people on this.

DR. SAMPSON: In summary, I feel that we have shown to the State of Nebraska that we have more than complied with their request in abating the pollution of the North Platte River, as charged three years ago.

Closing Statement - Mr. Stein

MR. STEIN: Do you want me to try to see if I can summarize and discuss this?

I think we all agreed at the second conference that, one, cognizance was taken of the progress made by sugar beet plants in Wyoming and Nebraska in treating their industrial waste. I don't think that either of the firms represented here have to worry about their advertising. I think certainly the Holly Sugar Company has presented their plan. They have done everything asked for, as far as I know, and they have lived up to it. They have put in the works they said they were going to put in and there is no indication, to my knowledge, that they are not being operated efficiently. We have seen Great Western here, as in other parts of the country, recognize that they do have a problem, and they are putting in a concerted and organized remedial program to correct wastes at their various plants. I don't see that there is anything to be ashamed of in the records of these companies.

Now, I also do think, as was pointed out by Wyoming representatives, that originally we came here with the objective of the reduction of sugar beet waste, and Holly was below that number. Presumably at most of its plants, Great Western is considerably below, too. I don't think there is any doubt about that. However, I think the objective that we all agreed to is the improvement of the water quality of the North Platte River, so as to allow its full use for fishing -- and I am quoting from the second conference -- as a wildlife habitat for recreational purposes and as a potential source of water supply for municipal and industrial uses.

Now, it seems to me that once we have gotten back beyond a certain point, I think it is only fair to state that the wastes put into the river now are such, I think, that uncontroverted statements from our biologists and the fish and game people of both States indicate that the river is not suitable, in their opinion, as a trout and sport water fishery. The question here is whether we are going to get the river from McConaughy Reservoir cleaned up to Torrington and above to make this suitable for a trout and sport fishery.

It also seems to me that the judgment on water use here has to be one on which the States make up their minds. Evidently, the fish and game people feel one thing, the agricultural people feel another thing, and I don't know that a majority vote is persuasive, necessarily, as far as the Federal law is concerned, because we have some States a little farther south where the people would love to live and do things a certain way, but I don't know that the Federal law will allow that.

The point here is, we have in our Federal law a statement that the primary rights and responsibilities for abating water pollution rests with the States. I think that a substantial job has been done of reducing the pollution load in the river, and is still being done. When the works at Gering are put in and the municipal treatment works are all in, I think we will see further improvement.

The point we have to arrive at here under the Federal law is, if the States in their sovereign capacities think that the best use of the river -- the Platte River -- what was referred to as the lower portion, below McConaughy Reservoir, up through Torrington -- is to be a trout stream -- a trout and game fishing stream, to be specific -- if this is what the States want then I think under the Federal law we have an obligation to see what we can do about abating the pollution. But this seems to me a determination for the States to make. It seems to me the key State here in this situation is Nebraska. It may be I will reverse that and not say the key one is Nebraska, but I think it is both. If Wyoming wants a trout and sport fishing stream and they want to clean up the river, as far as I understand it it will do them no good to clean this river up, necessarily because the fish won't get up from McConaughy Reservoir.

Closing Statement - Mr. Stein

If Wyoming wants to complain about a fish block down in Nebraska, I think this is a legitimate complaint. On the other hand, if Nebraska wants a trout stream, a trout and sport fishing stream, and it cleans up and prepares its water for treatment -- and assuming the statements we heard here are correct, and I have no reason to doubt them, so let us assume that 20 miles down into Nebraska wastes from the Torrington area will make this unavailable or unsuitable for trout fishing, then I think Nebraska has a complaint. I think -- and this is what I want to make clear in this situation -- I think the States have arrived at the point here where they have to do more than just say they want it, or that a particular segment of the State wants it. We all understand our interested groups, and I think this is fair.

Off the record.

(Discussion off the record.)

All right. I think what we need is a manifestation of State policy on this. The State policy must not only be when any particular group says this is important or not important, but this has to be translated into a water pollution control program. As soon as either State indicates that they are getting the water cleaned up so it can maintain this fishery, then I think there will be a situation where we may be obliged to see that the other State supplies commensurate water. Specifically, I think Nebraska with its program is entitled to have water flowing across the State line at least as good as it is treating. It should not be degraded by any use or by discharge from Wyoming. If this proves to be the case I think we will keep this under surveillance.

Now, let me say here, I appreciate the recommendation and the suggestion that the States resolve their policy on what they intend for this stream and proceed accordingly. I think also in closing this off we can recommend that, or I can tell your views to the Secretary. I do think, though, that under our Federal Water Pollution Control Act we have a responsibility for the keeping of specific water courses under surveillance. We would hope that both States would keep the North Platte River under surveillance and under their own program and decide what use they want to make of the stream.

I would say on the basis of past experience we have not come into the North Platte River, or the South Platte, too, for that matter, on the initiative of Washington. In other words, we were requested to come in here. I would suspect that if one of the States decided to have a trout and sport river fishery, and this is for them, and they felt themselves damaged or aggrieved by the other State, past experience has indicated that they are not very bashful. If they felt they needed help we would hear from them.

I might point out that even if they didn't, and if we didn't hear from them and they had this situation, and our indications revealed that there was an interference with water use, the Secretary might feel on his own initiative that he might have to reconvene this. Now, I say this is only if the State decided that it was going to have this in use.

I think with that we can call this conference closed.

DR. SAMPSON: You know what this reminds me of? It reminds me of the country girl who went to her first cocktail party. She was there a couple of hours and when she went to bid the hostess good-by she said, "Oh, Mrs. Smith, I am so glad you invited me, because I feel so much more like I do now than I did when I got here."

MR. BORTHWICK: May I inquire with reference to the remarks you just made? Are you saying then that the policy on the part of a particular State with reference to the use of the waters within the State will be considered by the Secretary in making determinations with reference --

MR. STEIN: No, I am just referring to this case. After all, as has been pointed out by Mr. Browning, this is the third time we are back here. I think Mr. Browning and Holly Sugar Company and Great Western Sugar Company and the communities here have complied for the first time around with what we have asked for in abating pollution. I think we are down to our real fine point here in this particular case of water use in a trout fishery, and I think in this particular case this thing is, in my opinion, up to the States to decide.

By the way -- and I would like to make this very clear, as you probably can appreciate this -- I don't think that I can speak, really, in any way, for the Secretary. I am giving you my opinion and my view on past experiences. When all the conferees have agreed on the point the Secretary has always gone along with it. He has never gone off on his own. I hope you will appreciate that I am not authorized to determine what the Secretary is going to do as a matter of policy.

MR. BORTHWICK: I gather from your remarks, though, that it would be important to the Secretary in his deliberations to know just what the policy is of both States with reference to the use of their water.

MR. STEIN: No. Maybe I put this out. I would say that as far as we are concerned, unless we get positive evidence or an indication that you want a trout stream here and a sports fishing stream, that we are not going to move. This is the point. As far as I can see, all we are going to do now when we go back is to keep this stream under surveillance as we keep 2,300-odd other rivers under routine surveillance as part of our job. I don't see any change in this unless it becomes indicated that, for example, Nebraska has so cleaned up the quality of its waters that the waters of Wyoming, for example, going across the border, are degrading those waters, and interfering with a particular use that Nebraska wants to make of those waters. That may be any of a variety of uses. The use that comes to mind here, it seems to me, is, as I have said, the trout and sports fishing operation. Otherwise we are not asking you for any positive statement.

MR. BORTHWICK: For what it is worth, let me say for the record that the Legislature has passed a law in the State of Wyoming which sets forth the preferential uses. No. 1 is agriculture and No. 2 is industrial.

MR. SAMSON: That wouldn't be binding as far as the State of Nebraska is concerned.

MR. BORTHWICK: I recognize that.

MR. STEIN: I think the key point boils down to this: I think Nebraska is entitled to quality water flowing across the State lines, at least equal to what they are going to provide themselves in their treatment. They cannot expect that water to be degraded beyond that provided by themselves, nor can they expect Wyoming to provide a higher degree of treatment than the kind of treatment they are providing for themselves.

MR. ENGENDORFF: Wouldn't it take the government of one of the two States to bring this thing back into focus unless you decide not to dissolve this?

MR. STEIN: No, I don't think this is a question of not dissolving it. Let me make this point clear. As far as I can see, unless anything comes up, this is a termination. The point is, these always have an open end. When we went away last time, as far as I was concerned I had no plans, and I don't think anybody in Washington had any plans of coming back. The point is, we were asked back. Now, if something would come up, then you have a problem. We have had case after case like that. I don't see that we have a problem of doing this.

By the way, this is all academic because if the Secretary wants to go into this as an interstate stream, all he has to do is sign a piece of paper and we go in on our own initiative. I think in this situation here, as contrasted to the South Platte, for example, this is a distinction really, without a difference. The point is, I see no point in assuming that we are going to be back here unless -- and we will put it on one State -- unless, for example, Nebraska cleans up its water or has a program for so doing, and the water coming over from Wyoming will interfere with what they consider legitimate uses in Nebraska. The most likely use, as far as we can see now, is a trout and sport fishery. If this is decided, this is fine.

If you should change your mind in Wyoming and want a sport fishery in Wyoming instead of Nebraska, and you feel you have a block downstream, we would be glad to entertain that, too. But otherwise we are at your disposal. Again, I ask you people to look at the record. As far as I can see, no one in Washington in this case was trigger-happy. We didn't rush in on our own initiative.

MR. WILLIAMSON: Can I make a comment here that might clarify this conference? As a result of the second conference we were asked to make monitoring surveys of this stream to gather data to determine what the condition was. This was made in November-December 1962. It was June when we got together to discuss that report. Among the technical people, who were quite diverse, it was two to one who felt that interstate pollution was pretty hard to prove, and yet there was a report written which said it was occurring. So we took objection to this report and said that the only people who could make a determination of pollution was the conference, and that we objected to a report being written saying this.

MR. STEIN: Right. By the way, I think this conference has been most useful and I think, both from the State point of view and Federal, we have gone to a point in this situation in Federal-State relations that we haven't reached in any other situation, to my knowledge. And I think it is resolving satisfactorily.

Let me go off the record.

(Discussion off the record.)

MR. SAMSON: This raises a question which Mr. Williamson and I asked Mr. Townley this morning just before we adjourned at noon, about some surveys that were made on the river here. What happened to those surveys? Weren't some of them made by Holly Sugar? I mean the supervision and control of Holly and also Great Western?

MR. WILLIAMSON: Under this November-December 1962 study, this is the one we were compiling.

MR. SAMSON: Is that the B.O.D. study?

MR. WILLIAMSON: Complete monitoring study. It was the whole stretch of the stream, and industry was asked to participate in this.

MR. SAMSON: Do you know what happened to that report?

MR. WILLIAMSON: This is the final copy right here which came out of that meeting.

MR. STEIN: It has been submitted to the conference.

MR. WILLIAMSON: Yes.

MR. SAMSON: May I inquire as to the preliminaries? Were those preliminary reports -- which resulted from the investigation under the supervision of the Great Western and Holly -- were those investigations incorporated in this report?

MR. WILLIAMSON: Not in this finished report, to the best of my knowledge.

DR. SAMPSON: The gentleman this morning said they were not.

MR. SAMSON: Where are they?

MR. WILLIAMSON: Who was to get them? I never saw anything other than the copies provided me by the Holly Sugar Company. They sent me copies.

MR. FILIPI: I am trying to work out what the routine was. I thought when the survey was being made this was being done in team work and all those data were being compiled. Because one sample taker would pick up a sample and he would take part of it to Great Western and part to the laboratory, and it was my understanding that that was just a coordination continuously there.

MR. SAMSON: I just wanted to clear it up.

MR. BROWNING: We had a routine spelled out very carefully in that meeting in June. We all followed it exactly and the reports that we compiled were sent to Mr. Filipi. What he did with them I don't know. Our portion of it was carried out and we sent them to you.

MR. FILIPI: I will have to check my records about the transmittal, because I know I didn't just file them away.

MR. STEIN: I think this is a kind of detailed thing. We are here to discuss detail, but I don't know that we are going to resolve this in a meeting of this kind because I just don't think we have the information.

MR. SAMSON: I have nothing further.

DR. SAMPSON: I have nothing further.

MR. STEIN: I would like to thank all of you for coming. I think the situation we have here is a very interesting one and very clear. I think this emphasizes the point that the primary right and responsibility in water pollution control rests with the States, and I think the States of Wyoming and Nebraska have to determine for themselves what they want to do from now on with this river.

We stand ready to help and, of course, to do whatever we have to do under the Federal law as to the assistance of States.

Are there any other comments or questions? If not, we will close.

MR. SAMSON: I would like the record to show that it has been a pleasure to be with my namesake, Dr. Sampson, and his able assistant, Mr. Williamson from Cheyenne.

DR. SAMPSON: Thank you, and it is nice to be back here, even if we are the defendants.

MR. STEIN: We don't consider you defendants.

DR. SAMPSON: I move we adjourn.

MR. STEIN: We are adjourned.

(Whereupon, at 2:45 p.m., the conference was adjourned.)

SUMMARY OF CONFERENCE

(FIRST SESSION)

POLLUTION OF INTERSTATE WATERS
OF THE
NORTH PLATTE RIVER

(WYOMING-NEBRASKA)

September 12, 1961

The North Platte River rises in Jackson County in Colorado from whence it flows northerly into the State of Wyoming. It then follows the pattern of a large loop, flowing through southeastern Wyoming, northerly, easterly, and southeasterly, and crosses the Wyoming State line near Torrington, Wyoming, into Scotts Bluff County, Nebraska. It courses through the southerly part of the State of Nebraska until it is joined by the South Platte River in Lincoln County, Nebraska. As the Platte River, it continues easterly across Nebraska to its confluence with the Missouri River below Omaha, Nebraska. The North Platte River Basin embraces an area of approximately 32,000 square miles, extending from north central Colorado to southeastern Wyoming and western Nebraska, and the river's waters are used for a number of beneficial purposes including irrigation, industrial application, municipal water supply, fishing, boating and other recreational uses.

In accordance with the written request dated July 21, 1961, of Dr. E. A. Rogers, Director of Health, Nebraska Department of Public Health, acting on behalf of the Nebraska State Water Pollution Control Council, the Surgeon General called a conference in the matter of the pollution of the interstate waters of the North Platte River and its tributaries in Nebraska and Wyoming, under the provisions of section 8 of the Federal Water Pollution Control Act (33 U.S.C. 466, et seq.). The Federal Act requires the

Surgeon General to call a conference when requested by a State water pollution control agency. The first session of the conference was held on September 12, 1961, at the City Hall, Scottsbluff, Nebraska.

The following conferees representing the State water pollution control agencies of Wyoming and Nebraska, and the Public Health Service attended the first session of the conference:

E. A. Rogers, M.D.	Nebraska Department of Health
John S. Samson	Nebraska Water Pollution Control Council
James W. Sampson, M.D.	Wyoming Department of Public Health
Arthur E. Williamson	Wyoming Department of Public Health
Herbert C. Clare	U.S. Public Health Service Kansas City, Missouri
Murray Stein, Chairman	U.S. Public Health Service Washington, D.C.

Also participating in the first session of the conference were the following:

C. Phillip Agee	Nebraska Game & Parks Commission Lincoln, Nebraska
L. S. Applegate	City Superintendent Torrington, Wyoming
Martin A. Bauer	U.S. Public Health Service Denver, Colorado
Joseph H. Bennett	Corps of Engineers, Omaha District Omaha, Nebraska
Clifford E. Bosley	Wyoming Game & Fish Department Lander, Wyoming
W. O. Bronen, M. D.	Rotary Club Scottsbluff, Nebraska

H. D. Burk	Nebraska Water Pollution Control Council & Great Western Sugar Company Scottsbluff, Nebraska
Earle S. Burwell	Wyoming Water Pollution Council Casper, Wyoming
Terry J. Carpenter	Town of Terrytown Terrytown, Nebraska
Don Christensen	Star-Herald Scottsbluff, Nebraska
S.A. Christensen	Wyoming Water Pollution Council
Don M. Culbertson	U.S. Geological Survey Lincoln, Nebraska
I.D. Croghan	Plant Superintendent Holly Sugar Corporation Torrington, Wyoming
O. Henry Engendorff	Wyoming Department of Agriculture Cheyenne, Wyoming
Harold E. Engstrom	Soil Conservation Service Lincoln, Nebraska
Joseph W. Fitzpatrick	U.S. Public Health Service Denver, Colorado
W. L. George	City of Bayard Bayard, Nebraska
W. A. Gibson	City Council, City of Torrington Torrington, Wyoming
R. L. Gilbert	Star-Herald Morrill, Nebraska
Lee Hall	Radio Station KOLT Scottsbluff, Nebraska
Lloyd T. Jensen	Great Western Sugar Company Denver, Colorado
F.W. Kittrell	U.S. Public Health Service Cincinnati, Ohio
Fred Klietsch	Nebraska Department of Water Resources Bridgeport, Nebraska

Albert S. Konselman	Bureau of Mines, Denver Federal Center Denver, Colorado
Carsten D. Leikvold	City Manager, City of Scottsbluff Scottsbluff, Nebraska
Frank E. Long	Wyoming Water Pollution Council Buffalo, Wyoming
B. W. Moore	City of Bayard Bayard, Nebraska
Frank Murphy	Wyoming State Engineers Office Torrington, Wyoming
George R. Myers	Member, Nebraska Department of Health Gering, Nebraska
Kaarlo W. Nasi	U.S. Public Health Service Denver, Colorado
Joe K. Neel	U.S. Public Health Service Kansas City, Missouri
William E. Nichol	Mayor, City of Scottsbluff Scottsbluff, Nebraska
J. L. Ogilvie	Bureau of Reclamation Denver, Colorado
Liven A. Peterson, Jr.	U.S. Bureau of Sport Fisheries & Wildlife Grand Island, Nebraska
J. R. Pringle	Farmers Irrigation District
Eugene L. Schmidt	U.S. Bureau of Land Management Cheyenne, Wyoming
R. M. Sensintaffar	U.S. Bureau of Reclamation Casper, Wyoming
A. D. Sidio	U.S. Public Health Service Cincinnati, Ohio
Roger Stelk	City of Bayard Bayard, Nebraska
Keith Stewart	City of Morrill Morill, Nebraska

R. E. Thomas	Nebraska Game & Parks Commission North Platte, Nebraska
T. H. Vanderhoff	West Nebraska Branch Laboratory Nebraska Department of Health Scottsbluff, Nebraska
Neal P. Wallace	Star-Herald Scottsbluff, Nebraska
Oscar Wiberg	Scottsbluff County Health Department Gering, Nebraska
K. F. William	City of Bayard Bayard, Nebraska
Roy Witschy	Nature Club Scottsbluff, Nebraska

The Chairman of the Conference pointed out that:

1. Under the Federal Water Pollution Control Act pollution of interstate waters which endangers the health or welfare of persons in a State other than that in which the discharges originate is subject to abatement under procedures described in section 8 of that Federal Act.

2. The first step of this procedure is the calling of a conference.

3. The purpose of the conference is to bring the States and the Public Health Service together to lay a basis for future action by all parties concerned and to give the States and localities an opportunity to take remedial action which may be indicated under State and local law.

In the light of the conference discussion, the conferees unanimously agreed to the following conclusions and recommendations:

1. That the North Platte River below Torrington, Wyoming is an interstate stream within the meaning of the Federal Water Pollution Control Act.

2. That pollution of interstate waters subject to abatement under the Federal Water Pollution Control Act is occurring in this stretch of the North Platte River.

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3. That the river above Torrington is a relatively clean stream.

4. That discharges of industrial wastes from a plant in Torrington, Wyoming, sewage from Lyman, Morrill, Scottsbluff, * Gering, Minitare, Melbeta, Bayard, and Bridgeport, Nebraska, and industrial wastes from plants at Mitchell, Gering, Scottsbluff, Bayard, and vicinity, pollute this stretch of the river so as to interfere with aquatic life, use of the river for recreation, fishing, boating, aesthetic enjoyment, and as a potential source of municipal and industrial water supply.

5. Adequate waste treatment facilities installed in Wyoming to abate pollution of the river as it crosses the State line and the installation of waste treatment facilities to treat adequately the municipal and industrial wastes being discharged into the river from sources in Nebraska are both needed to abate pollution of the North Platte River.

6. Cognizance is taken of progress made by sugar beet plants in Wyoming and Nebraska in treating their industrial wastes. However, the objective sought is improvement of the water quality of the river so as to allow its full use for fishing, as a wildlife habitat, for recreational purposes, and as a potential source of water supply for municipal and industrial uses.

7. The Public Health Service, in cooperation with State agencies, municipalities and industries involved, will conduct an investigation and study of the river during the current 1961-62 sugar beet campaign to obtain bacteriological, biological, chemical, stream flow, and other pertinent data to properly assess the sources of industrial and municipal wastes, the

*Terrytown was inadvertently omitted from the Summary as distributed to the conferees.

kinds of coliform bacteria present in the river, and their effects on water quality.

8. The data obtained by the investigation and study will be made available to the interested State agencies, municipalities, industries, and other interested parties.

9. After completion of the investigation and study, the conference will be reconvened by the chairman to consider the results obtained and to agree on action to be taken to abate pollution of the North Platte River.

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SUMMARY OF CONFERENCE
(SECOND SESSION)
POLLUTION OF THE INTERSTATE WATERS
OF THE
NORTH PLATTE RIVER
(WYOMING-NEBRASKA)

March 21, 1962

The second session of the conference in the matter of pollution of the Interstate Waters of the North Platte River in Nebraska and Wyoming was held on March 21, 1962 at the State Highway Department Auditorium, Cheyenne, Wyoming, under the provisions of section 8 of the Federal Water Pollution Control Act (33 U.S.C. 466 et seq.). A summary of the first session held September 12, 1961, is attached hereto and made a part thereof.

The North Platte River rises in Jackson County in Colorado from whence it flows northerly into the State of Wyoming. It then follows the pattern of a large loop, flowing through southeastern Wyoming, northerly, easterly, and southeasterly, and crosses the Wyoming State line near Torrington, Wyoming, into Scotts Bluff County, Nebraska. It courses through the southerly part of the State of Nebraska until it is joined by the South Platte River in Lincoln County, Nebraska. As the Platte River, it continues easterly across Nebraska to its confluence with the Missouri River below Omaha, Nebraska. The North Platte River Basin embraces an area of approximately 32,000 square miles extending from north central Colorado to southeastern Wyoming and western Nebraska, and the river's waters are used for a number of beneficial purposes, including irrigation, industrial application, fishing, boating and other recreational uses. It is a potential source of municipal water supply.

The following conferees representing the State water pollution control agencies of Wyoming and Nebraska, and the Department of Health, Education, and Welfare, attended the second session of the Conference:

E. A. Rogers, M.D.	Nebraska Department of Health
John S. Samson	Nebraska Water Pollution Control Council
S. A. Christensen	Wyoming Stream Pollution Control Advisory Council Evanston, Wyoming
Arthur E. Williamson	Wyoming Department of Public Health
Herbert C. Clare	U.S. Department of Health, Education, and Welfare Kansas City, Missouri
Mr. Murray Stein, Chairman	U.S. Department of Health, Education, and Welfare Washington, D.C.

Also participating in the second session of the conference were the following:

Frank C. Ames	U.S. Geological Survey Denver, Colorado
J. E. Browning	Holly Sugar Corporation Colorado Springs, Colorado
Harold D. Burk	Great Western Sugar Company Scottsbluff, Nebraska
Earle G. Burwell	Wyoming Stream Pollution Control Advisory Council Casper, Wyoming
Harold F. Clark	U.S. Department of Health, Education, and Welfare Cincinnati, Ohio
I. D. Croghan	Holly Sugar Corporation Torrington, Wyoming
Kenneth P. Day	Wyoming Stream Pollution Control Advisory Council Saratoga, Wyoming

O. Henry Engendorff	Wyoming Stream Pollution Control Advisory Council Cheyenne, Wyoming
T. A. Filipi	Nebraska Department of Health Lincoln, Nebraska
Joseph W. Fitzpatrick	U.S. Department of Health, Education, and Welfare Denver, Colorado
C. M. Hanson	Holly Sugar Corporation Colorado Springs, Colorado
Lloyd T. Jensen	Great Western Sugar Company Denver, Colorado
Albert S. Konselman	U.S. Bureau of Mines Denver, Colorado
Frank E. Long	Wyoming Stream Pollution Control Advisory Council Buffalo, Wyoming
Russell G. Ludwig	Holly Sugar Corporation Arcadia, California
Raymond E. McGuire	U.S. Corps of Engineers Omaha, Nebraska
Russell McKown	U.S. National Park Service Omaha, Nebraska
Joe K. Neel	U.S. Department of Health, Education, and Welfare Kansas City, Missouri
J. L. Ogilvie	U.S. Bureau of Reclamation Denver, Colorado
John T. Peryam	Wyoming Stream Pollution Control Advisory Council Encampment, Wyoming
John J. Rooney	Representing Senator J.J. Hickey Cheyenne, Wyoming
A. D. Sidio	U.S. Department of Health, Education, and Welfare Cincinnati, Ohio
Don Tennant	U.S. Fish & Wildlife Service Grand Island, Nebraska

The Chairman of the Conference pointed out that:

1. Under the Federal Water Pollution Control Act pollution of interstate waters which endangers the health or welfare of persons in a State other than that in which the discharges originate is subject to abatement under procedures prescribed by section 8 of that Federal Act.

2. The first step of this procedure is the calling of a conference.

3. The purpose of the conference is to bring the States and the U.S. Department of Health, Education, and Welfare together to review the situation, to lay a basis for future action by all parties concerned, and to give the States and localities an opportunity to take any remedial action which may be indicated under State and local law.

4. This is the second session of the Conference in the Matter of Pollution of the Interstate Waters of the North Platte River involving the States of Wyoming and Nebraska.

5. At the first session of the Conference it was agreed that the Department of Health, Education, and Welfare, in cooperation with the State agencies, municipalities and industries involved, would conduct an investigation and study of the river during the current 1961-62 sugar beet campaign to obtain bacteriological biological, chemical, stream flow, and other pertinent data, in order to assess properly the sources of industrial and municipal wastes, the kinds of coliform bacteria present in the river, and their effects on water quality. That investigation and study has been completed.

6. The purpose of this session of the Conference is to consider the results obtained by the study and investigation and to agree on action to be taken to abate pollution in the North Platte River.

In the light of Conference discussions, the following conclusions were reached and recommendations made:

1. The investigation and study substantially supports the recommendations made at the first session of the Conference and confirms it conclusions which are incorporated herein and made a part hereof.

2. Findings in the study indicate that discharges of industrial wastes from a plant in Torrington, Wyoming, sewage from Lyman, Morrill, Scottsbluff, Gering, Minatare, Melbeta, Bayard, and Bridgeport, Nebraska, and industrial wastes from plants at Mitchell, Gering, Scottsbluff, Bayard, Nebraska and vicinity, pollute this stretch of the river so as to interfere with aquatic life, use of the river for recreation, fishing, boating, aesthetic enjoyment, and as a potential source of municipal and industrial water supply.

3. Adequate waste treatment facilities installed in Wyoming to abate pollution of the river as it crosses the State line and the installation of waste treatment facilities to treat adequately the municipal and industrial wastes being discharged into the river from sources in Nebraska, are both needed to abate pollution of the North Platte River.

4. Cognizance was again taken of progress made by sugar beet plants in Wyoming and Nebraska in treating their industrial wastes. However, the objective sought is improvement of the water quality of the river so as to allow its full use for fishing, as a wildlife habitat, for recreational purposes, and as a potential source of water supply for municipal and industrial uses.

5. Holly Sugar Company at Torrington, Wyoming, will proceed with the necessary pipeline, pumping, and percolation ponds or equivalent to provide for disposal of sewage and industrial wastes in order to keep out of the

river pulp screenings, silo drainage, and septic tank discharges, and to devise a method for efficient screening of the final waste effluent. These remedial facilities are to be in operation by the beginning of the 1962-63 sugar beet campaign.

6. The Nebraska Department of Health will provide a voluntary effective program to control pollution of the North Platte River in Nebraska.

7. A program for sampling, analyzing and monitoring the effects of discharges from the industrial sources on the river from Torrington, Wyoming to Broadwater, Nebraska, will be established and in operation by the beginning of the 1962-63 sugar beet campaign. The program will include but not be limited to analysis of dissolved oxygen, B.O.D., suspended solids and the nature of bacteria present.

The Federal government has an obligation in connection with that program, but industry should be given an opportunity to inaugurate and conduct this activity in cooperation with the State water pollution control agencies. Accordingly, the Wyoming Department of Public Health and the Nebraska Department of Health will furnish the Department of Health, Education, and Welfare details of the program by August 1, 1962, so that the Department of Health, Education, and Welfare can evaluate the situation.

It is understood the Department of Health, Education, and Welfare will be called upon in the event the monitoring program indicates the presence of fecal streptococci or fecal coliforms.

8. At the end of the 1962-63 sugar beet campaign all parties concerned will evaluate the accomplishment and effectiveness of the program agreed upon with a view to determining the need for another session of the conference.

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SUMMARY OF CONFERENCE
(THIRD SESSION)
POLLUTION OF INTERSTATE WATERS
OF THE
NORTH PLATTE RIVER
(WYOMING-NEBRASKA)
November 20, 1963

The third session of the conference in the matter of pollution of the interstate waters of the North Platte River (Wyoming-Nebraska) was held on November 20, 1963, at the City Council Chambers, City Hall, Scottsbluff, Nebraska, under the provisions of section 8 of the Federal Water Pollution Control Act (33 U.S.C. 466 et seq.). A summary of the first session held September 12, 1961, and the second session held March 21, 1962 are attached hereto and made a part thereof.

The North Platte River rises in Jackson County, Colorado, then flows northerly into the State of Wyoming. It then follows the pattern of a large loop, flowing through southeastern Wyoming, northerly, easterly, and southeasterly, and crosses the Wyoming State line near Torrington, Wyoming, into Scotts Bluff County, Nebraska. It courses through the southern part of the State of Nebraska until it is joined by the South Platte River in Lincoln County, Nebraska. As the Platte River, it continues easterly across Nebraska to its confluence with the Missouri River below Omaha, Nebraska. The North Platte River Basin embraces an area of approximately 32,000 square miles extending from north central Colorado to southeastern Wyoming and western Nebraska. The river's waters are used for a number of beneficial purposes, including irrigation, industrial water supply, fishing, boating, other recreational uses, and are a potential source of municipal water supply.

The following conferees representing the State water pollution control agencies of Wyoming and Nebraska, and the Department of Health, Education, and Welfare, attended the third session of the conference:

Dr. E. A. Rogers	Director of Health Nebraska Department of Health Lincoln, Nebraska
John S. Samson	Nebraska Water Pollution Control Council Omaha, Nebraska
Dr. James W. Sampson	Director of Public Health Wyoming Department of Public Health Cheyenne, Wyoming
Arthur E. Williamson	State Sanitary Engineer Wyoming Department of Public Health Cheyenne, Wyoming
Herbert C. Clare	U.S. Department of Health, Education and Welfare Public Health Service Kansas City, Missouri
Murray Stein, Chairman	U.S. Department of Health, Education and Welfare Public Health Service Washington, D.C.

Also participating in the third session of the conference were the following:

Clifford E. Bosley	Wyoming Game and Fish Commission Lander, Wyoming
J. E. Browning	Holly Sugar Corporation Colorado Springs, Colorado
H. D. Burk	Great Western Sugar Company Scottsbluff, Nebraska
Harold F. Clark	U.S. Department of Health, Education, and Welfare Public Health Service Cincinnati, Ohio
Fred Eiserman	Wyoming Game and Fish Commission Casper, Wyoming

O. Henry Engendorff	Commissioner of Agriculture Wyoming Department of Agriculture Cheyenne, Wyoming
T. A. Filipi	Nebraska Department of Health Lincoln, Nebraska
Jack R. Geckler	U.S. Department of Health, Education, and Welfare Public Health Service Cincinnati, Ohio
Lloyd T. Jensen	Great Western Sugar Company Denver, Colorado
Albert S. Konselman	U.S. Department of the Interior Bureau of Mines Denver, Colorado
William Schoenecker	Nebraska Game, Forestation and Parks Commission Alliance, Nebraska
R. M. Sensintaffar	U.S. Department of the Interior Bureau of Reclamation Casper, Wyoming
Donald A. Townley	U.S. Department of Health, Education, and Welfare Public Health Service Kansas City, Missouri
Ray C. Williams	U.S. Department of the Interior Bureau of Sport Fisheries and Wildlife Grand Island, Nebraska

The Chairman of the Conference pointed out that:

1. Under the Federal Water Pollution Control Act pollution of interstate waters which endangers the health or welfare of persons in a State other than that in which the discharges originate is subject to abatement under procedures prescribed by section 8 of the Federal Act.

2. The first step of these procedures is the calling of a conference.

3. The purpose of the conference is to bring the States and the U.S. Department of Health, Education, and Welfare together to review the existing situation and progress made; to lay a basis for future action by all

parties concerned; and to give the States and localities an opportunity to take any remedial action which may be indicated under State and local law.

4. This is the third session of the conference in the matter of pollution of the interstate waters of the North Platte River involving the States of Wyoming and Nebraska.

5. At the first session of the conference it was agreed that the Department of Health, Education, and Welfare, in cooperation with the State agencies, municipalities and industries involved, would conduct an investigation and study of the river during the 1961-1962 sugar beet campaign to obtain bacteriological, biological, chemical, stream flow, and other pertinent data, in order to assess properly the sources of industrial and municipal wastes, the kinds of coliform bacteria present in the river, and their effects on water quality. This investigation and study was completed and the conclusions reached and recommendations made at the second session were based upon it.

6. At the second session of the conference it was recommended that installation of adequate waste treatment facilities was needed in Wyoming to abate pollution of the river as it crosses the State line and the installation of waste treatment facilities was needed to treat adequately the municipal and industrial wastes being discharged into the river from sources in Nebraska. It was further recommended that Holly Sugar Company install industrial and domestic waste treatment devices, these remedial facilities to be in operation by the beginning of the 1962-1963 sugar beet campaign. The Nebraska Department of Health was to provide a voluntary effective program to control pollution of the North Platte River in Nebraska. The conferees agreed that at the end of the 1962-1963 sugar beet campaign all parties concerned should evaluate the accomplishment and

effectiveness of the monitoring program agreed upon. Such an evaluation was completed, and as a result this third session was held.

In the light of conference discussions the following conclusions were reached and recommendations made:

1. The objective of all the conferees as stated at the second session is the improvement of the water quality of the North Platte River so as to allow its full use for fishing, as a wildlife habitat, for recreational purposes, and as a potential source of water supply for municipal and industrial use.

2. The Holly Sugar Corporation and the Great Western Sugar Company have taken the remedial action previously recommended by the conferees. The Holly Sugar Corporation in Torrington, Wyoming, discharges about three pounds of biochemical oxygen demand per ton of beets, which is well below the objective of eight pounds per ton agreed to by the Wyoming, Nebraska, and Federal authorities at earlier conference sessions.

3. Cognizance is taken of the fact that there has been significant improvement of water quality of the North Platte River. Although substantial progress is being made in providing waste treatment facilities, technical reports presented at this conference indicate that water quality is still not suitable for trout spawning, although the river is used as a trout sport fishery on a "put and take" basis. The determination whether the water quality of the North Platte River is to be further improved so as to support spawning of trout is to be made by the States of Nebraska and Wyoming.

4. Conferees representing Nebraska and Wyoming suggested that the conference be concluded with the understanding that if at any future time either State believed interferences with its water uses were occurring, that State could request another conference session.

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